ESPRESSO COFFEE MACHINE

USE AND MAINTENANCE MANUAL

Instructions for the technician

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ENGLISH

Summary

SUMMARY follows

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ENCLOSURES

Review

Rev 02 - 01/2005 - General review

Rev 03 - 05/2005 - Update Electrical Diagrams - ELE-

ESPRESSO COFFEE MACHINE

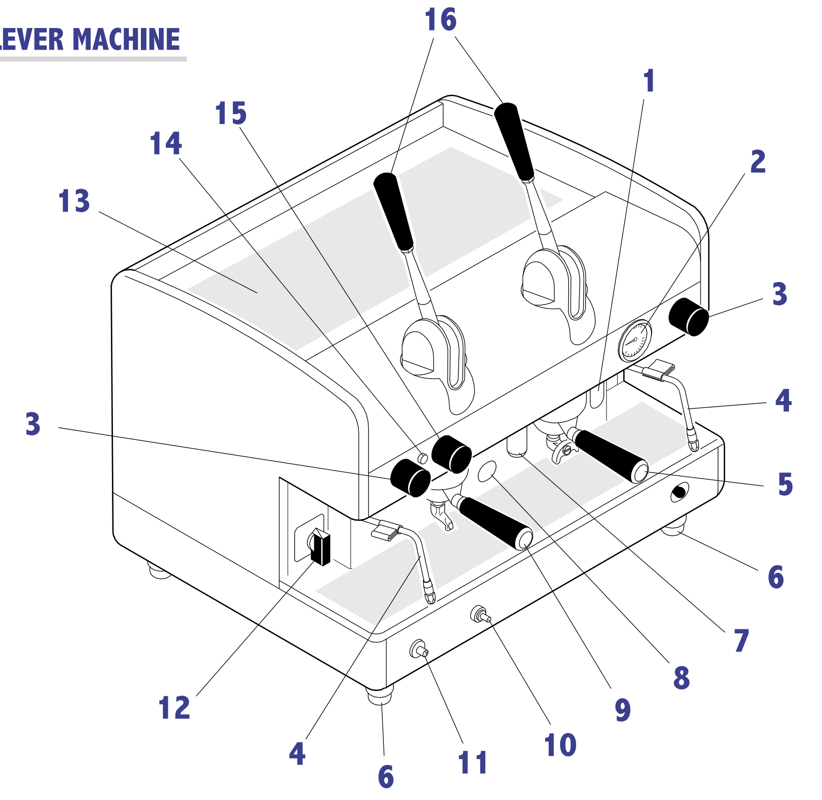
USE AND MAINTENANCE MANUAL

Instructions for technician

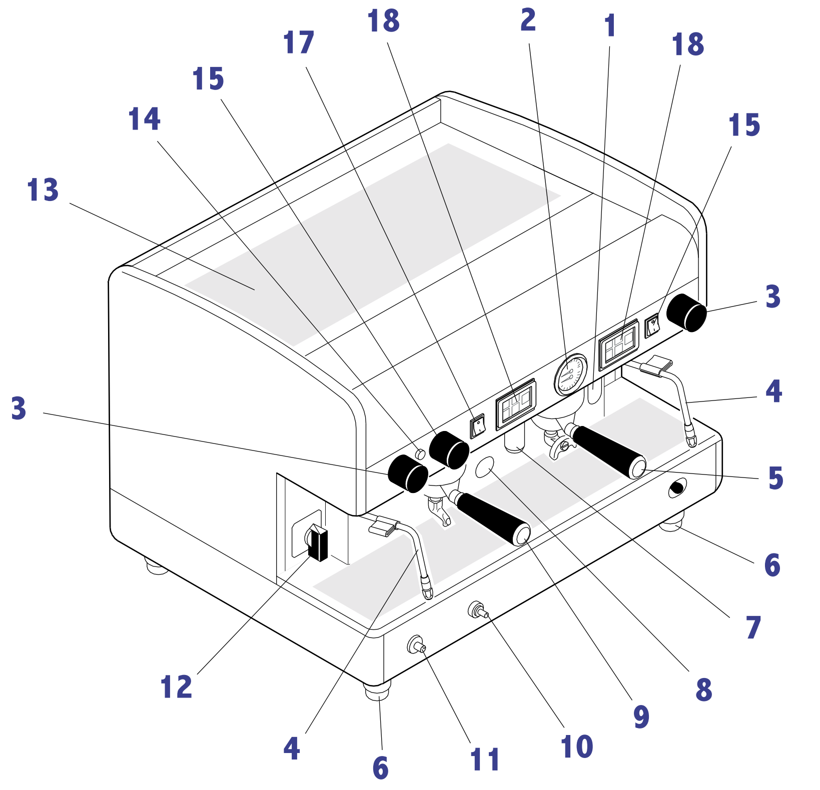
1. TECHNICAL CHARACTERISTICS

1	Boiler level-check window
2	Gauge
3	Steam gauge
4	Steam nozzle
5	2-cup filter holder
6	Adjustable foot
7	Hot water dispensing spout
8	Gas burner viewing window (if included)
9	1-cup filter holder
10	Gas safety (if included)
11	Gas ignition push button (if included)
12	Machine main switch
13	Cup rest grille
14	Machine on indicator light
15	Hot water knob
16	Lever groups
17	Manual delivery switches
18	Push button panels (for version SAE-SME)

LEVER MACHINE



DISTRIBUTION MACHINE



TECHNICAL CHARACTERISTICS

Version	JUNIOR	1 Group	2 Groups	3 Groups	4 Groups
Boiler capacity (lt)	5	5 - 8	10,5 - 14	17 - 21	23
Power supply voltage(V)	120 - 230 240	120 - 230 240 - 400	120 - 230 240 - 400	230 240 - 400	240 - 400
Boiler pressure (bar)	0.8 - 1.4 MAX				
Safety valve calibration (bar)	2				
Supply water pressure (bar)	1.5 - 5 MAX				
Coffee dispensing pressure	8 - 9				

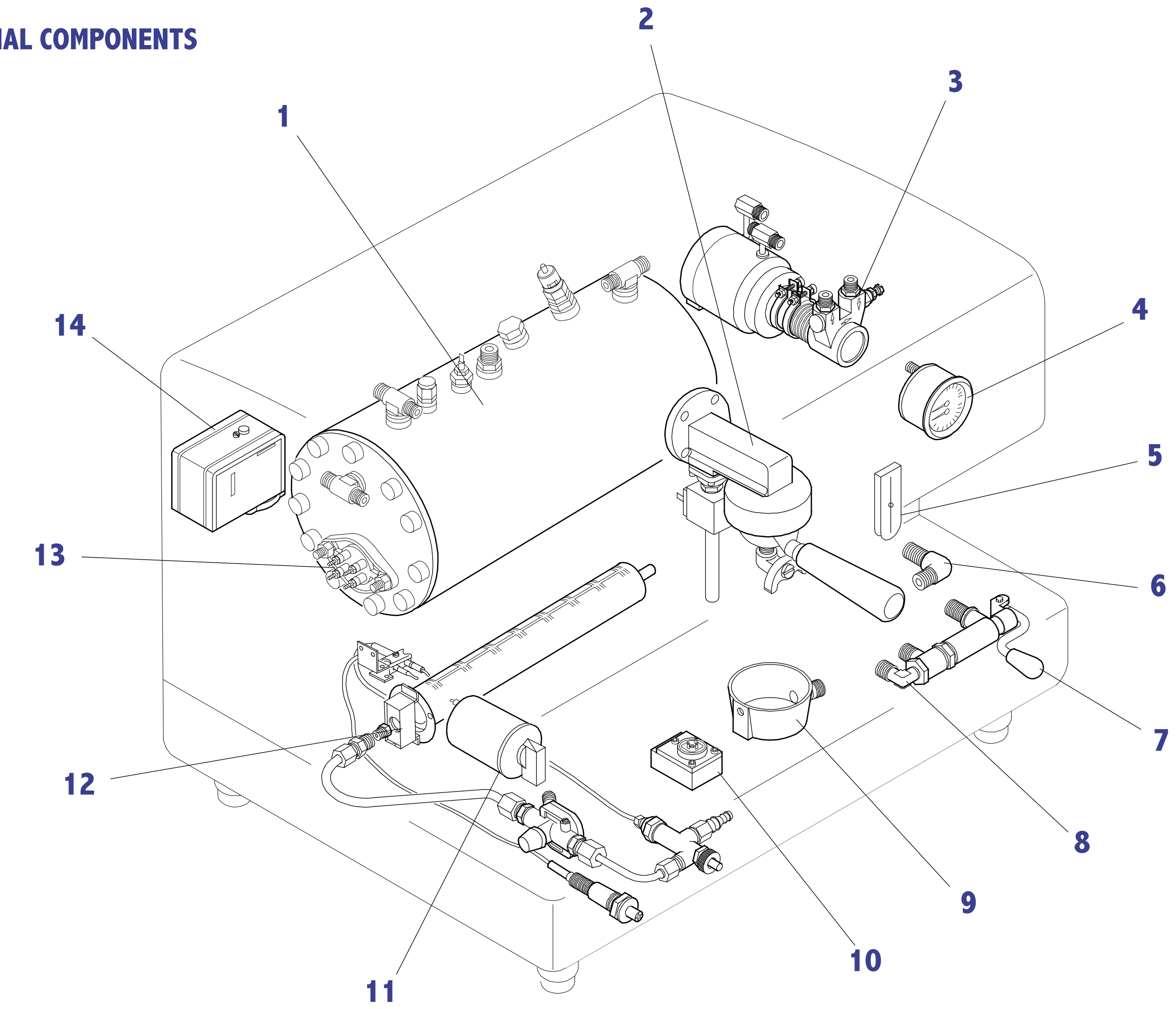
STANDARD POWER

Version	JUNIOR	1 Group	2 Groups	3 Groups	4 Groups
120 V	2000 W	2000 W	2600 W	---	---
230 V	2000 W	2000 W	2600 W	3700 W	5000 W
240 V	2400 W	2400 W	3100 W	4400 W	6000 W
240 V - 6 POLES	---	2350 W	6000 W (U.K.)	6000 W (U.K.)	---
230 / 400 V - 6 POLES	1800 W	1800 W	2600 W	3700 W	5000 W

INCREASED POWER (on request - in compliance with regulations)

Version	JUNIOR	1 Group	2 Groups	3 Groups	4 Groups
230 V	---	---	4000 W	5000 W	---
240 V	---	---	4700 W	6000 W	---
230 / 400 V - 6 POLES	2700 W	2700 W	4000 W	5000 W	7000 W

INTERNAL COMPONENTS

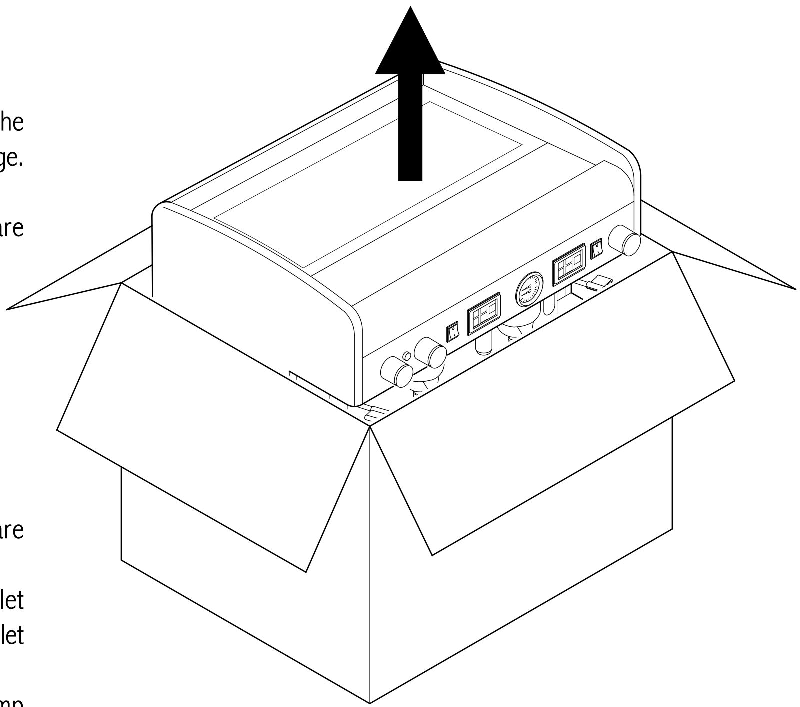


1	Boiler
2	Delivery group
3	Internal motor pump (if included)
4	Boiler / motor pump pressure gauge
5	Boiler level-check window
6	Internal pump water attachment connection (if included)
7	Manual water pump
8	External pump water attachment connection
9	Drain tub
10	Volumetric dosing device (SAE-SME)
11	Machine main switch
12	Gas system (if included)
13	Electrical heating element
14	Pressure switch

2. PREPARATION OF THE MACHINE

2.1 UNPACKING

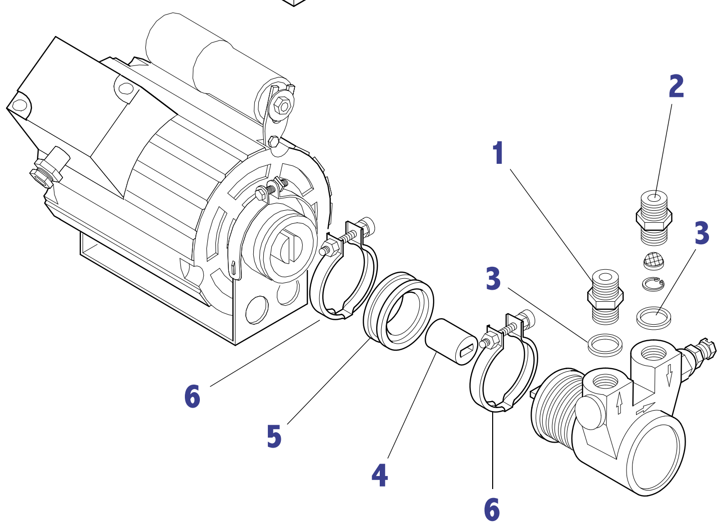
Open the packaging, taking care not to damage it. Remove the machine protections and the equipment contained in the package. Take the machine out.
If there is an external motor pump, the motor and the pump are provided in separate packaging.



2.2 EQUIPMENT PREPARATION

Motor pump

In machines with an external motor, it is necessary to prepare the pump and the motor.
Fit the 3/8 gas connection with filter **(2)** at the pump inlet (arrow ↓) and the plain 3/8 connection **(1)** at the pump outlet (arrow ↑).
Attention: install the connection with filter **(2)** at the pump inlet.
Use the special washers **(3)** provided for the seal.
To correctly couple the pump and motor, use the appropriate joint **(4)** and the spacer ring **(5)**. Lock all of this with the two clamps **(6)**.
The pump-motor joint is also installed in machines with an internal motor, with the exception of the Junior version and the Zecchin type motors.

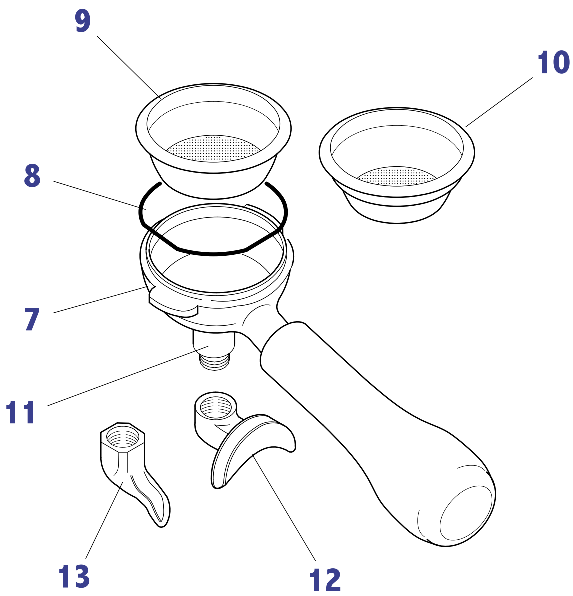


Filter-holder

In the housing of the filter holder **(7)**, place the filter clamp spring **(8)**. Take the two-cup **(9)** or one-cup **(10)** filter and press it firmly into the filter holder.

Spouts

Complete the filter holder by installing the two-cup **(12)** or one-cup **(13)** spout.
In Italy provide for an extension cord **(11)**.
Attention: install the spout on the relative filter holder: one-cup spout on one-cup filter, etc.

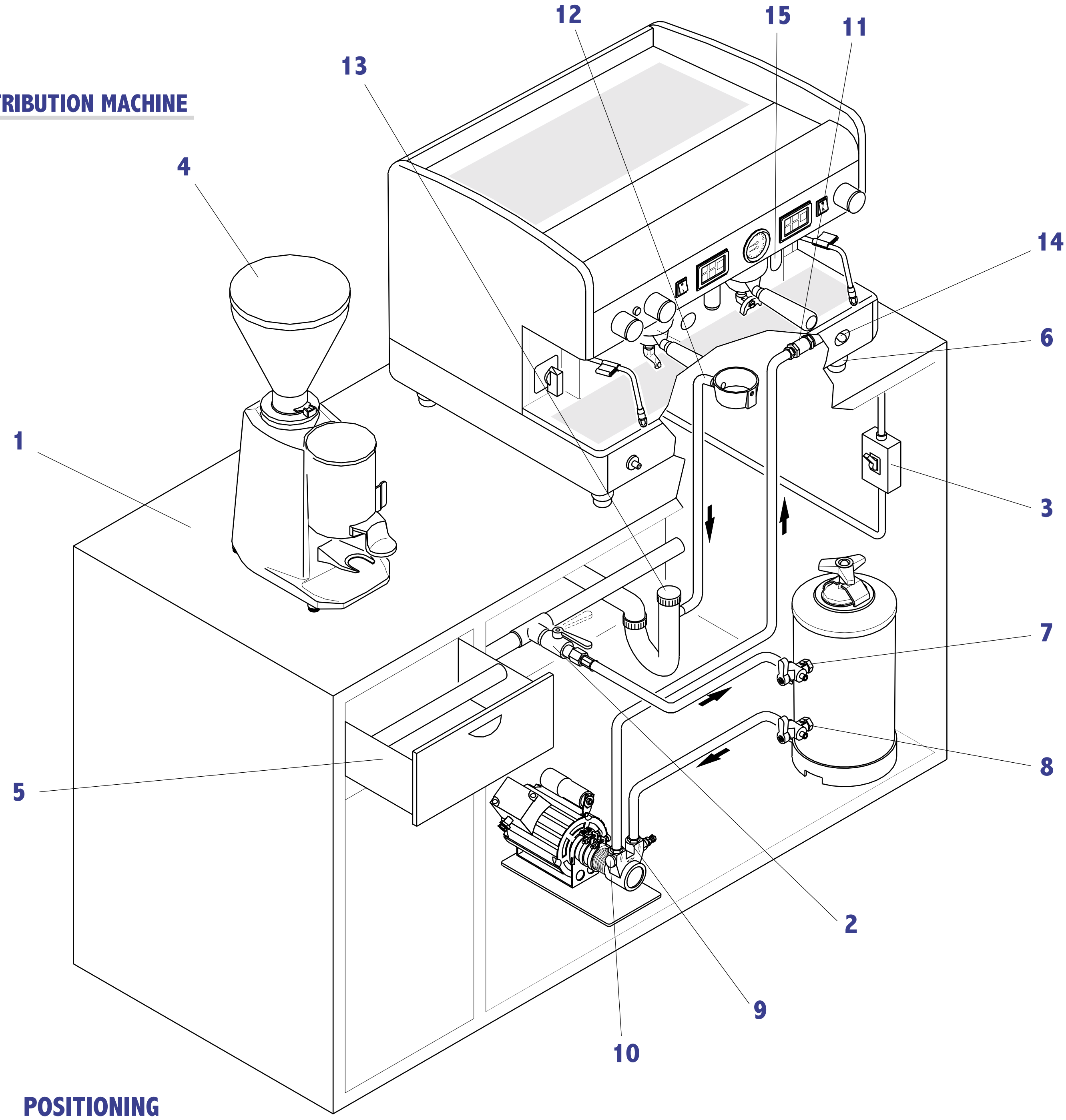


Softener

The resin softener is standard equipment on versions AEAP-SMAT and SAE-SME. It is furnished on request in versions AL-SMMA and AEP-SMSA.
On request, an automatic resin softener is supplied.
The "Multi Head" anti-lime scale device is provided on request and is installed directly on the hydraulic circuit of the machine.
For further information, refer to the "Softeners" chapter.

3. MACHINE INSTALLATION

DISTRIBUTION MACHINE



3.1 POSITIONING

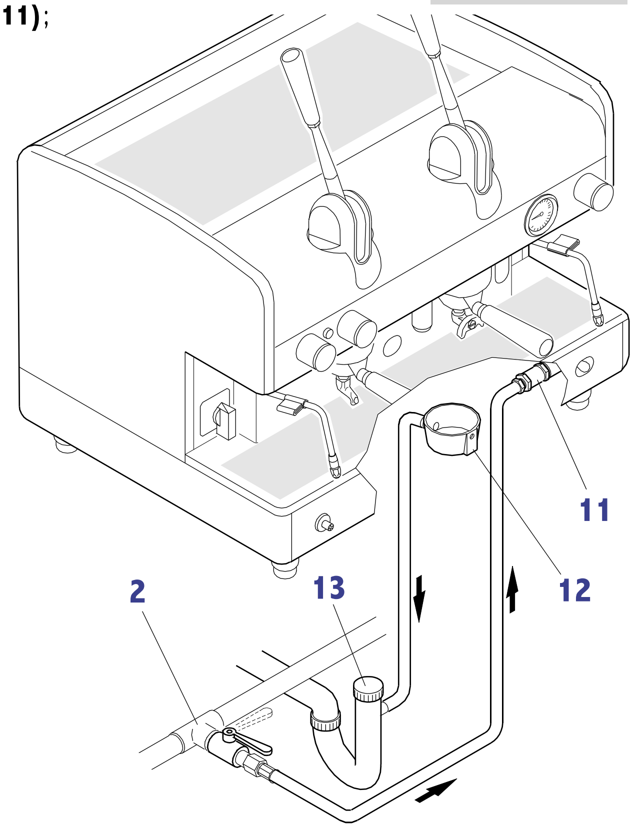
Prepare an ample support base for the machine that is suitable to support its weight **(1)**. It is important for all terminals of connections to the water mains **(2)**, to the electrical mains **(3)** and to the gas mains (in included), to be easily reachable and in any case in the immediate vicinity of the machine.
Make sure that there is sufficient space for placing and correctly using the appliance. The grinding-dosing machine **(4)** must be placed in the immediate vicinity of the appliance in order to allow for comfortable use of the machine.
It is advisable to equip the working base of the machine with a drawer **(5)** for used coffee grounds. Preferably this would also have a rubber device to tap the filter holder against.

WARNING
*For correct operation, the machine must rest on a perfectly horizontal surface. Any alignment adjustments of the machine must be done by adjusting the feet.**(6)***

3.2 HYDRAULIC CONNECTION FOR AEP-SMSA AEAP-SMAT SAE-SME MACHINES

1) Remove any rubber plugs which may be inserted in the tap fixtures of the softener.
2) Connect the water mains **(2)** to the softener inlet **(7)** using the provided hose.
3) rinse resins from the softener and check that the water, which initially comes out yellowish, comes out clean
4) connect the softener outlet **(8)** to the external motor pump inlet **(9)**;
5) connect the outlet of the motor pump **(10)** to the inlet of the machine **(11)**;
6) connect the drain tub of the machine **(12)** to the sewer discharge **(13)** using the special tube provided. Take care to avoid overly tight bends or kinks, and make sure that there is sufficient inclination for water to flow out of the drain.

LEVER MACHINE



3.2 HYDRAULIC CONNECTION OF AL-SMMA MACHINES

1) Remove any rubber plugs which may be inserted in the tap fixtures of the softener.
2) connect the water mains **(2)** to the inlet of the machine **(11)**;
3) connect the drain tub of the machine **(12)** to the sewer discharge **(13)** using the special tube provided. Take care to avoid overly tight bends or kinks, and make sure that there is sufficient inclination for water to flow out of the drain.

NOTE
All filling connections are 3/8 male gas type. The drain tub is connected with a tube with an internal diameter of 16mm.

Warnings

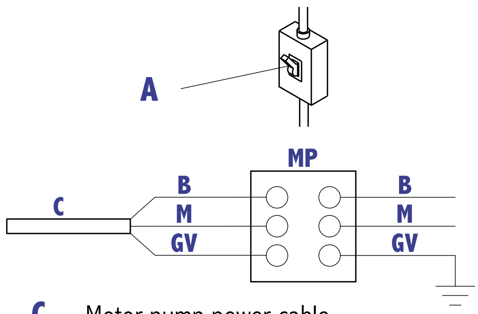
1) The water mains must provide cold water for human consumption (potable water) at a pressure between 1 and 5 bar inclusive If the pressure is greater than 5 bar, connect a pressure reducer upstream from the pump.
2) insert a tap **(2)** on the water mains supply so that it will be possible to cut off water flow to the machine;
3) in order to prevent damage to the outer covering, to the valves or to the taps, install the softener where it will be protected from accidental blows;
4) to prevent the water from freezing, install the softener in rooms with an ambient temperature of more than 0°C;
5) if there is no softener, connect the water mains **(2)** directly to the inlet of the external motor pump **(9)**;
6) if there is an internal motor pump, connect the outlet of the softener **(8)** (if there is one) or the water mains **(2)** directly to the machine inlet **(11)**;
7) when connecting the tub of the machine to the sewer drain, avoid overly tight curves or kinks, and make sure that there is sufficient inclination for water to flow out of the drain.
8) the drain must be connected to an inspectionable siphon that can be periodically cleaned in order to avoid the backflow of unpleasant odours;
9) to avoid oxidization and damage to the machine over time, do not use iron connections for the hydraulic connections, even if they are galvanized.

WARNING
If hydraulic connection is not to the water mains but to an external tank, it is advisable to place a non-return valve between the machine and the tank. The connection pipe between the machine and the external tank must not be greater than 150 cm.

NOTE
In all machines equipped with automatic water filling, there is an automatic time control device which allows the boiler to be filled with water within a maximum period of time. This function keeps water from coming out of the valve of the boiler (flooding) and keeps the motor pump from overheating.
If the maximum time is not enough for the boiler to fill up completely (machines installed with 3 or 4 groups), turn the machine off and then back on, and repeat the operations shown above.
When the machine is started for the first time, it is advisable to fill the boiler manually using the knob **(14)**

3.3 ELECTRICAL CONNECTION

On the electrical mains, it is advisable to install a main protection switch **(A)**



C Motor pump power cable
MP Motor pump terminal
B Blue
M Brown
GV Yellow-green

Machine with INTERNAL MOTOR PUMP

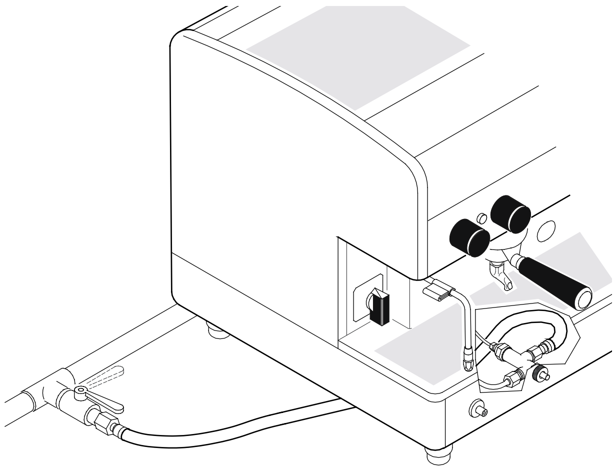
Connect the power cable as set forth in the chapter "Electrical diagrams" (the cable has a cross-section and number of wires based on the power and voltage of the machine).

Machine with EXTERNAL MOTOR PUMP

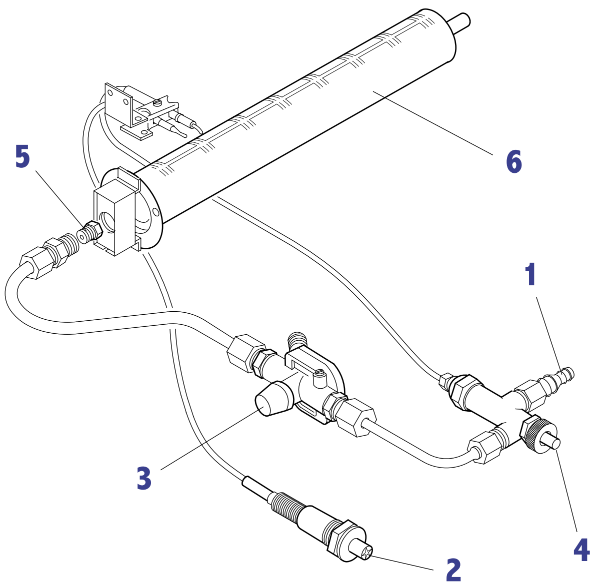
1) Connect the cable to the motor pump (with lesser cross section) to the connector as shown in the diagram shown alongside.
2) Connect the machine power cable (with greater cross section) as set forth in the chapter "Electrical diagrams".

WARNING
Always connect the motor pump cable before the machine power supply cable, in accordance with the diagram provided. Failure to comply with the instructions given above may cause serious damage to the machine an/or to the motor pump and will invalidate any guarantee. Carry out all electrical connections with the power supply disconnected.

3.4 GAS CONNECTION (if provided for)



Install a pressure reducer upstream from the gas system. When operating on gas, the machine emits combustion fumes directly into the surroundings where it is being used. Therefore, gas-powered machines must not be installed in rooms with a volume of less than 12 m^3, as described in standards UNI 7129 and UNI 7131.
On the pipe works upstream from the machine, a cut-off cock must be installed. If flexible hoses rather than stiff pipes are used for connections, they must be compliant with standard UNI 7140. These hoses must not be more than one metre long, and they must be firmly attached to the hose connection with a safety clamp (UNI 7141). They must not be placed near potential heat sources, they must not reach a temperature greater than 50°C, they must not be subjected to traction or twisting stress, and they must not have any kinks in them. It must be possible to inspect them along their entire length, and they must not come into contact with sharp objects or sharp corners.
The machine is assembled with the methane gas nozzle already installed. The nozzle for city gas or gas cylinders is provided. Check that the nozzle is appropriate to the type of gas being used before lighting the burner. The incoming gas pipe must be equipped with a cut-off cock near the machine (see the provided gas diagram).
At the cock outlet there will as necessary be installed a flexible hose or a stiff copper pipe. Pipe connections to the machine must be made in accordance with current standards in the country of installation. If connection is made with a flexible hose, first of all insert the hose into the gas safety hose connection.
If instead you would like to make a stiff connection, you can use a soft copper pipe Ø6x8, equipped with a 1/4 gas nipple at the gas safety (remove the hose connection first).



1. Hose connection tube
2. Gas ignition push button
3. Gas self-regulator
4. Gas safety
5. Nozzle
6. Burner

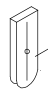
NOTE
To adjust the gas system, refer to chapter12.
The water in the boiler can be heated in various ways: only electrically (machines without gas system), only with gas (version AL - SMMA), with a combined system of gas and electricity (machines with gas system).

For the installation of the most suitable injector, see the table shown alongside.

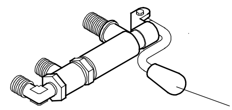
WARNING
Do not under any circumstances attempt to light the gas without first installing the proper injector. As soon as connection is complete, check for any gas leaks by placing a soapy solution on all connections.

Version	METHANE gas (18 mbar)	LPG (28/37 mbar)
1 Group	ø 1.00 (1.75 kW)	ø 0.60 (1.50 kW)
2 Groups	ø 1.10 (2.25 kW)	ø 0.65 (1.75 kW)
3 Groups	ø 1.35 (3.20 kW)	ø 0.80 (2.50 kW)
4 Groups	ø 1.45 (4.00 kW)	ø 0.85 (3.00 kW)

3.5 STARTING THE MACHINE

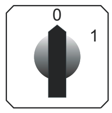

1

Before starting the machine, make sure that the level of water in the boiler is higher than the minimum level on the level-check window **(1)**. If there is no water (first installation or after boiler maintenance), it is necessary to fill the boiler in advance, so as to prevent overheating of the heating element. Proceed as follows:


2

Switch

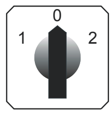
Open the water tap of the water mains and of the softener.
Using manual fill **(2)** fill the boiler with water until the optimal level is restored.
Turn the switch to position "**1**" and wait for the machine to warm up completely.



Switch

Commutator

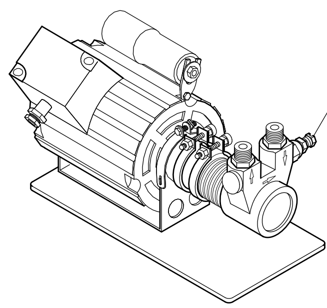
Open the water tap of the water mains and of the softener.
Turn the switch to position "**1**" (electrical power supplied to the pump for automatic boiler filling and machine services) and wait for the boiler to be automatically filled with water.
Turn the switch to position "**2**" (full electrical power supplied, including the heating element in the boiler) and wait for the machine to warm up completely.



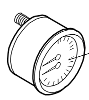
Commutator

WARNING
- during the machine's warm-up phase (roughly 20 minutes), the negative pressure valve will release steam for a few seconds until the valve itself closes
- before using the machine, run deliveries dry with the filter holder attached for a few seconds to release any air which may be in the circuit, so that the delivery groups are completely heated
- before using the machine, dispense a few servings of coffee to test the grinding and to check the operating pressure of the machine

3.6 EXTERNAL MOTOR PUMP ADJUSTMENT


3

To adjust operating pressure proceed as follows:
- Use a coffee delivery switch.
- Adjust the pressure by turning the screw located on the pump **(3)** so as to obtain a pressure of between 8 and 9 bar. Tightening the screw increases pressure, and loosening it reduces pressure. Check the pressure by means of the gauge **(4)** located on the front part of the machine;
- turn off the delivery switch;

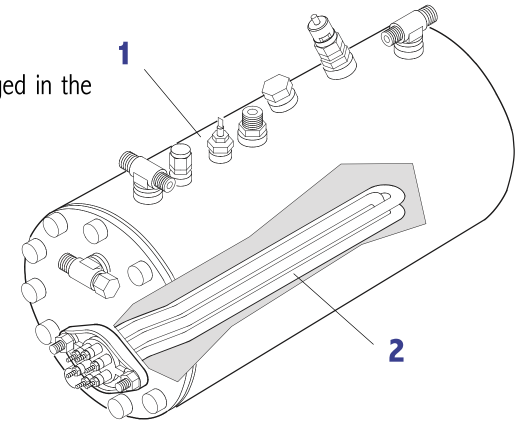

4

4. Distribution machine BOILER and EXCHANGERS

The boiler is constructed in copper sheet metal **(1)**, to which the heat exchangers are assembled which in turn are connected to the delivery group. Water for coffee delivery is taken directly from the heat exchanger. During delivery cold water is sent to the inside of the exchanger by means of the motor pump. Inside the heat exchanger, cold water and the pre-existing hot water are mixed, thus obtaining optimal water temperature for coffee infusion. The AL-SMMA does not have a heat exchanger, therefore water is taken directly from the boiler.

4.1 ELECTRIC HEATING

The water is heated in the boiler by means of an electrical heating element that is immerged in the water **(2)**.



4.2 GAS HEATING

Gas heating is obtained by supplying the flame of the burner located under the boiler.

4.3 COMBINED GAS + ELECTRIC HEATING

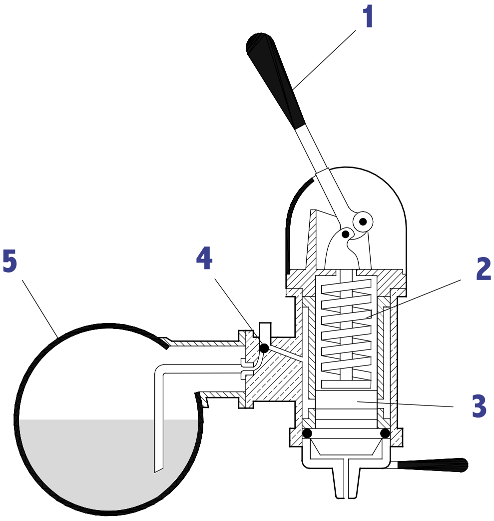
In machines equipped with both systems, it is possible to combine the heating types.

5. COFFEE DELIVERY GROUPS

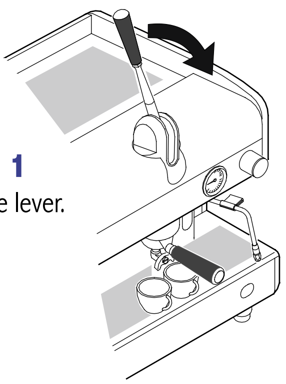
The delivery group and the heat exchanger are the fundamental components in obtaining espresso coffee. Specifically, the purpose of the group is to dispense the coffee.

5.1 LEVER GROUP

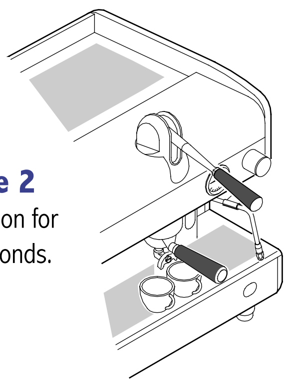
The lever group uses the boiler pressure and water. This system does not require heat exchangers.
When the lever **(1)** is lowered, the spring **(2)** inside the group is compressed: the piston **(3)** raises, allowing water to enter the pre-infusion jacket. When the lever is released, the piston compresses the water to 8-10 bar, allowing delivery of espresso coffee. The non-return ball valve **(4)** keeps water from flowing back into the boiler **(5)**.



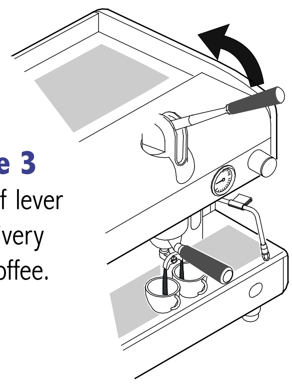
Phase 1
Lowering the lever.



Phase 2
Pre-infusion for 3÷5 seconds.



Phase 3
Release of lever and delivery of the coffee.

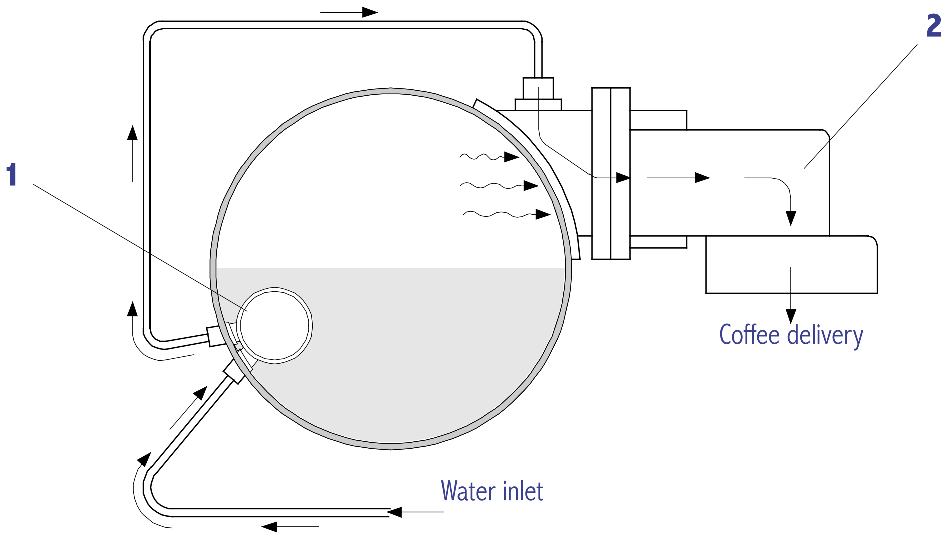


5.2 CARTRIDGE EXCHANGER SYSTEM

Heating of the delivery group is provided by direct contact with the boiler. Water used for delivery of coffee is taken from a so-called "cartridge" exchanger which is immersed in the water of the boiler.

- the activation of the solenoid valve and of the pump allow cold water to enter the exchanger **(1)**.
- From the exchanger **(1)** the boiler water is carried to the group duct **(2)** for delivery.
- the pump allows the increase of the pressure of the water flow up to 8-9 bar.

If necessary, the exchanger can be replaced by removing the flange and disconnecting the relative pipes of the hydraulic circuit. These operations should be carried out after the machine has been switched down and has cooled off. Always replace the seals.

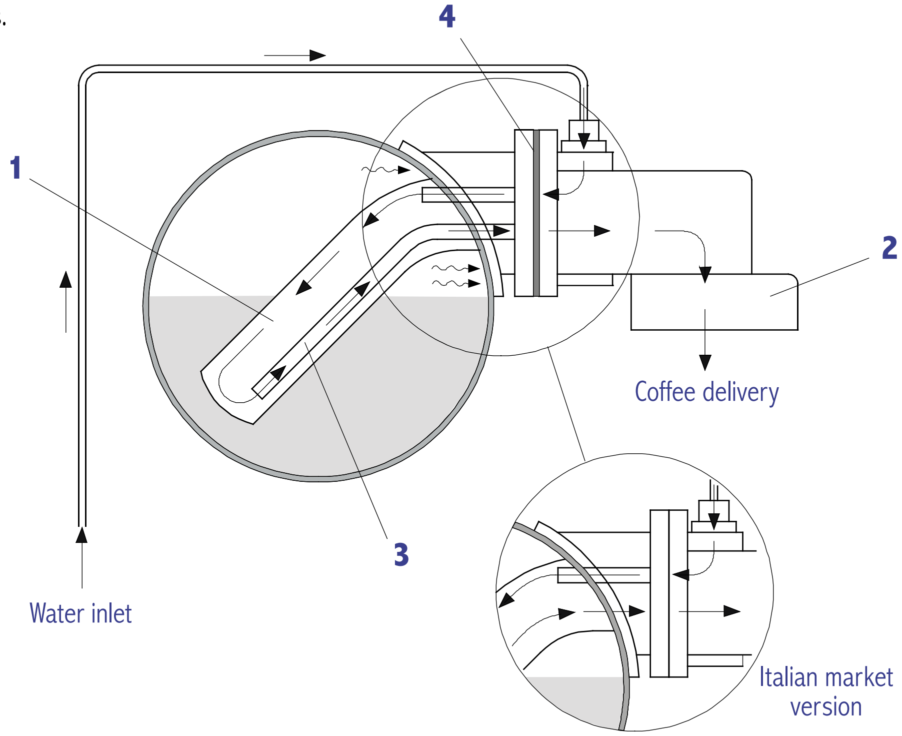


5.3 EXTRACTABLE EXCHANGER SYSTEM

Heating of the delivery group is provided by direct contact with the boiler. Water used for delivery of coffee is taken from a so-called "extractable" exchanger which is immersed in the water of the boiler.

- the activation of the solenoid valve and of the pump allow cold water to enter the exchanger **(1)**.
- From the exchanger **(1)** the boiler water is carried to the group duct **(2)** for delivery.
- the pump allows the increase of the pressure of the water flow up to 8-9 bar.

The version of the extractable exchanger for the Italian market does not include the suction device **(3)** and the seal **(4)**.
If necessary, the exchanger can be replaced without having to remove the flange. Loosen the screws, remove the delivery group from the boiler and remove the exchanger. These operations should be carried out after the machine has been switched down and has cooled off. Always replace the seals.

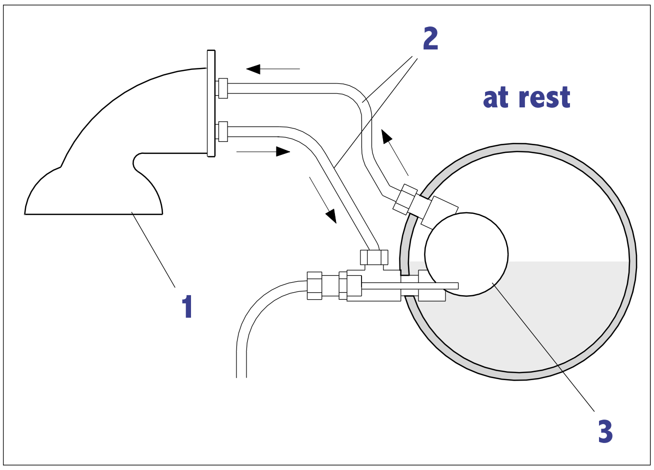


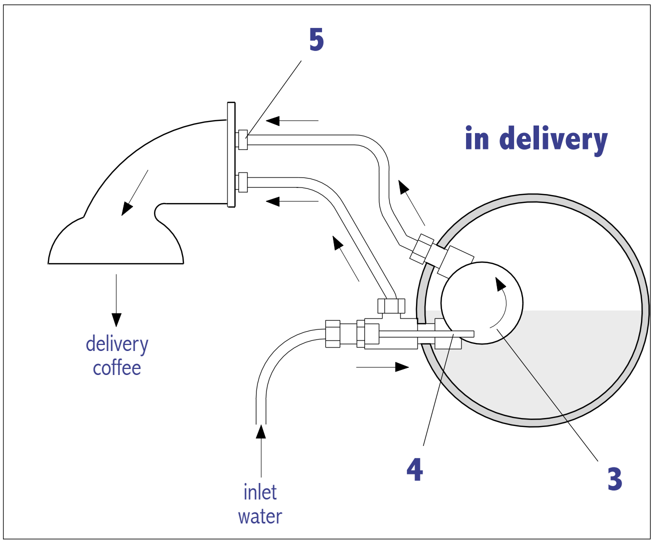
5.4 CTS SYSTEM (thermosiphon system)

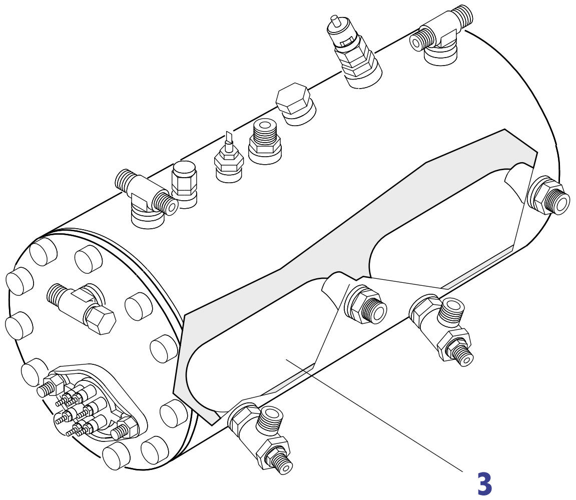
In this system, the delivery group **(1)** is heated by a thermosiphon circuit **(2)** connected to the heat exchanger **(3)**. The same water is used for coffee delivery, thus ensuring the same temperature for all coffee servings.

- activation of the solenoid valve and of the pump allow cold water to enter the exchanger **(3)** through the injector **(4)**.
- from the exchanger **(3)** the boiler water is carried to the group **(4)** for delivery;
- the pump allows the increase of the pressure of the water flow up to 8-9 bar for delivery.

The injector **(4)** and the flow reducer **(5)** are important components for the operation of the delivery group.
To increase the coffee extraction temperature, remove the flow reducer **(5)** or replace it with one of a greater diameter. To decrease the temperature, replace it with one of a smaller diameter.
If necessary, the exchangers can be replaced by removing the flange and disconnecting the relative pipes of the hydraulic circuit. These operations should be carried out after the machine has been switched down and has cooled off. Always replace the seals.





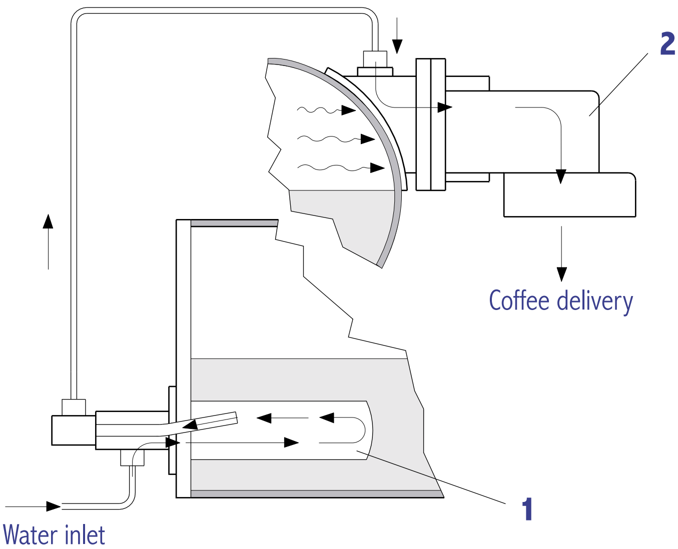


5.5 BOOSTED SYSTEM

Heating of the delivery group is provided by direct contact with the boiler. Water used for delivery of coffee is taken from an exchanger which is immersed in the water of the boiler and attached to the.

- the activation of the solenoid valve and of the pump allow cold water to enter the exchanger **(1)**.
- From the exchanger **(1)** the boiler water is carried to the group duct **(2)** for delivery.
- the pump allows the increase of the pressure of the water flow up to 8-9 bar.

The exchanger can be replaced without having to remove the flange. Loosen the screws, and detach the flange that holds the exchanger. Perform these operations when the machine is off and is cool. Always replace the seals.



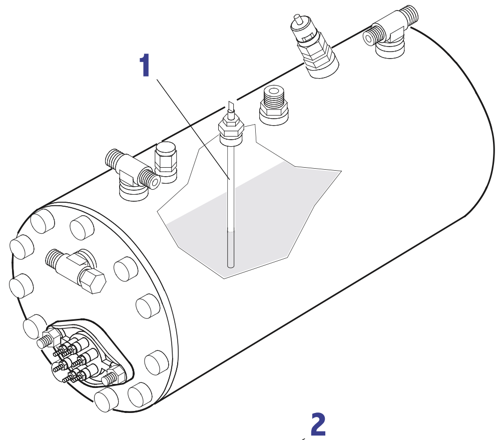
6. Automatic Water Entry

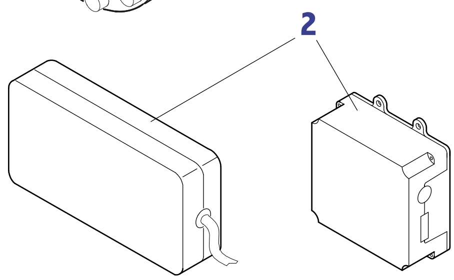
The AEA system (Automatic Water Entry) is for checking the boiler level. It is composed of:

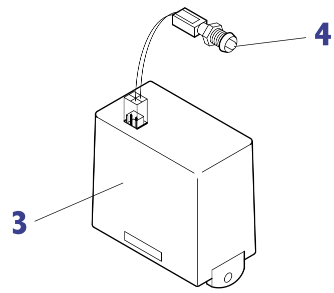
- sensor inserted in the boiler **(1)**, composed of a stainless steel rod;
- control unit **(2)** standard on SAE-SME machines, electronic level regulator on other versions **(3)**;
- hydraulic circuit with a solenoid valve controlled by the regulator.

The electronic control unit controls the level of water in the boiler. When the level of water in the boiler drops, the contact with the probe is interrupted. The control unit sends and impulse to the entry solenoid valve **(1)** and to the motor pump **(2)**, which act to restore the normal level of water in the boiler.

To avoid possible flooding due to machine malfunctions or leaks in the hydraulic circuit, the electronic control unit includes a timing device that cuts off automatic filling after a certain time (roughly 30 seconds). The LED **(4)** located on the front of the machine body comes on to indicate activation of this system. During the installation of machines with three or four groups the initial water filling time may exceed the established time limit. In this event, just switch the machine off and then back on to restore normal operating conditions.



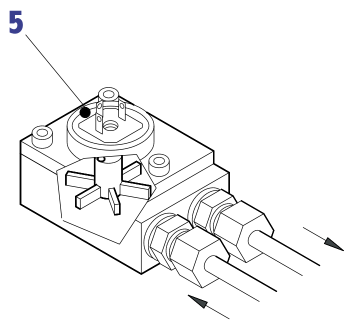




WARNING
Always check the level of the water in the boiler by means of the level-check window placed on the front of the machine.

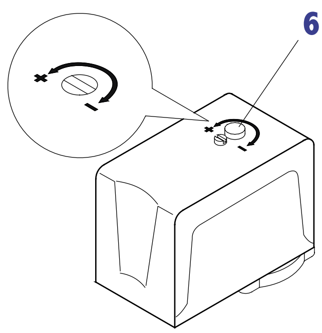
7. VOLUMETRIC DOSING

The volumetric dosing device installed on the SAE-SME electronic machines serves the purpose of measuring the quantity of water sent to the group of espresso delivery.
The dosing device generates an electrical impulse which is sent to the electronic control unit. This impulse is read by the control unit and memorized during the programming of the dose.
The flashing of the LED **(5)** indicates that the electrical impulse has been sent from the dosing device to the control unit.



8. PRESSURE SWITCH

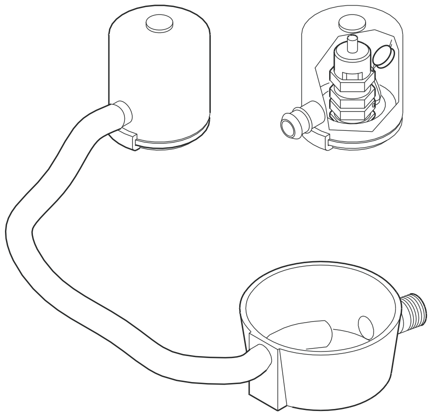
The pressure switch makes it possible to control boiler pressure by activating or bypassing the heating element in the boiler.
Any calibration of the pressure switch which may be required can be carried out with the machine in operation by means of the screw **(6)** located on the body of the component.



WARNING
The internal contacts of the pressure switch may be subject to oxidization. It is recommended to periodically clean the contacts with anti-oxidant spray.

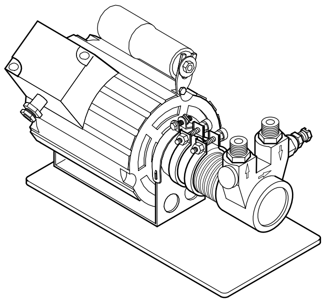
9. ANTI-FLOODING DEVICE

The cover installed on the pressure modulating switch makes it possible, by means of the special tube, to collect and carry to the drain tub any water which may exit the boiler to due any malfunction of the machine.



10. PUMPING SYSTEM

This is a component that serves the purpose of feeding the machine, raising the water pressure to 8-9 bar for the delivery of the coffee and for automatic filling of the boiler.

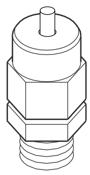


11. VALVE GROUP

The valves are devices whose purpose is to ensure the safety and proper operation of the machine.

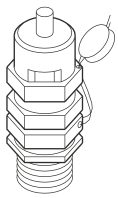
11.1 NEGATIVE PRESSURE VALVE

The purpose of the negative pressure valve is to prevent the backflow of liquids through the steam nozzle when they are being heated. Furthermore, the excess air is eliminated inside the boiler during the heating phase of the machine.



11.2 SAFETY OR PRESSURE RELIEF VALVE

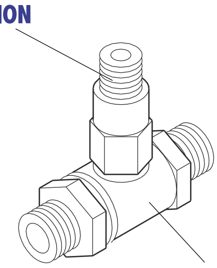
The pressure relief valve guarantees that the pressure in the boiler does not go above 2 bar. If there is a malfunction, the capacity of the valve is such that it can eliminate all of the excess pressure in the valve.



11.3 EXPANSION VALVE - NON-RETURN VALVE

This is a valve consisting of an expansion valve and a non-return valve.

- Expansion valve: the cold water sent from the pump to the heat exchangers is heated. This heating causes an increase in the volume of water. To limit increases of pressure in the hydraulic circuit, the valve limits the maximum internal pressure of the circuit to 12 bar.
- non-return valve: Its function is that of preventing the back flow of water from the exchangers in the hydraulic circuit.

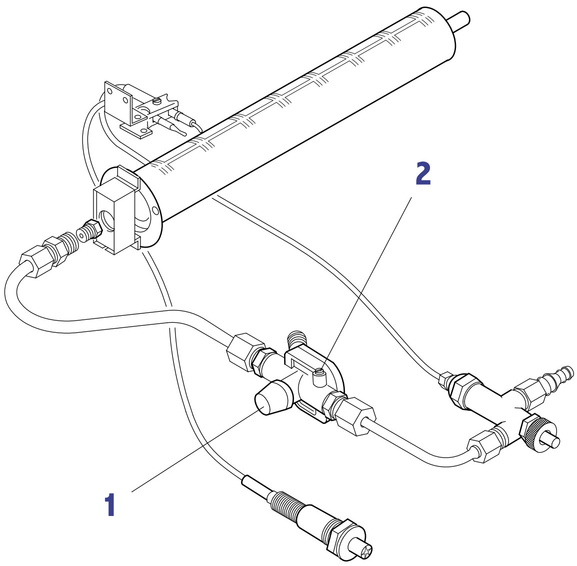


NOTE
On all machines with four groups, two pressure relief valves are installed.

12. GAS SYSTEM

The gas system is useful in heating the water in the boiler. It does not, except in special cases, substitute the electrical heating system, but rather works along with it.
For machines with levers, operation may be either electric or gas.

WARNING
If you decide to use only the gas heating system, no electrical devices are active, including automatic boiler filling.



Gas adjustment

- Lighting the burner
- loosen the locknut **(1)**;
- give the screw two turns and place the minimum regulator pin **(2)** so as to have maximum opening of the gas minimum passage;
- wait for boiler pressure to reach 1.4 bar (see boiler gauge);
- turn the minimum pin **(2)** clockwise until the burner flame is barely visible (pilot flame);
- lower the pressure in the boiler down to 1 bar;
- turn the adjustment screw for the maximum clockwise until the flame is up to maximum;
- tighten the locknut thus locking the screw.

The operation described above places the machine in an operating range of 1.2-1.3 bar. If you want to increase or decrease operating pressure in the boiler, proceed as above, varying the parameters as follows:
<u>to decrease:</u>
- set the maximum to 1.3 bar and the minimum to 0.9 bar. You will obtain pressure in the boiler of 1.1-1.2 bar.

<u>to increase:</u>
- adjust the maximum to 1.5 bar and the minimum to 1.1 bar. You will obtain a pressure in the boiler of 1.3-1.4 bar (this is the maximum recommended pressure limit)

WARNING
When operating on gas, the machine emits combustion fumes directly into the surroundings where it is being used. Therefore, gas-powered machines must not be installed in rooms with a volume of less than 12 m³, as described in standards UNI 7129 and UNI 7131.
In closed rooms, always provide ventilation openings to release any possible gas leaks.

13. SOFTENERS

Mains water contains insoluble salts, which cause the build-up of lime scale deposits in the boiler and in other parts of the machine. The softener makes it possible to eliminate or substantially reduce the presence of these mineral salts.

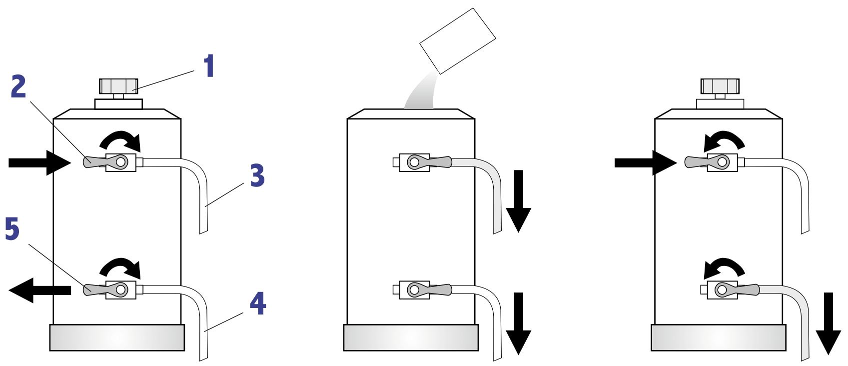
13.1 RESIN SOFTENER

The resin softener has the property of retaining the calcium contained in the water. For this reason after a certain period the resins are saturated and are to be regenerated with coarse kitchen salt (NaCL, sodium chloride) or special water softening salt. It is very important to regenerate the softener within the established times.
The regeneration is to be done regularly every 15 days. However, in locations with very hard water, it will be necessary to regenerate more frequently. The same is true of places in which there is a large consumption of hot water for tea or other uses.

Softener regeneration

Proceed as follows:

- move levers **(2)** and **(5)** from left to right;
- Remove the lid by loosening the knob **(1).**
- Release enough water through the pipe **(3)** to make room for the amount of salt as required depending on the model (see table).
- Clean any salt or resin residue from the gasket located on the lid.
- Put the lid back in place by screwing the knob **(1)** down securely and move the lever **(2)** back from right to left.
- Let the salt water drain from the small tube **(4)** until the water is no longer salty (about 30-60 minutes). The salt allows the accumulated mineral salts to be released.
- Bring the lever **(5)** from right to left back to its initial position.



Model softener	Amount of salt
8 litres	1.0 kg
12 litres	1.5 kg
16 litres	2.0 kg

WARNING

The build-up of lime scale in the hydraulic circuit and boiler inhibit thermal exchange, thus compromising proper operation of the machine. Heavy incrustation in the boiler may cause long machine shutdowns and in any case invalidate any guarantee, because this symptom indicates that regeneration has been neglected.

In order to keep the softener and hence the machine in perfect operating condition, it is necessary to perform regeneration periodically based on the use of the softener and the hardness of the water that is used.
The table alongside shows the values of the quantity of softened water based on the hardness of the water in the various units of measure:

- F°: French degree
- D°: German degree
- mg $CaCO_3$

Amount of softened water based on hardness					
F°	30°	40°	60°	80°	**salt**
D°	16.5°	22°	33°	44°	
mg $CaCO_3$	300	400	600	800	
8 litres	1000 lt	900 lt	700 lt	500 lt	1.0 kg
12 litres	1500 lt	1350 lt	1050 lt	750 lt	1.5 kg
16 litres	2100 lt	1800 lt	1400 lt	1000 lt	2.0 kg

For further information on installation, start-up and regeneration of the softener, refer to the relative instruction manual.

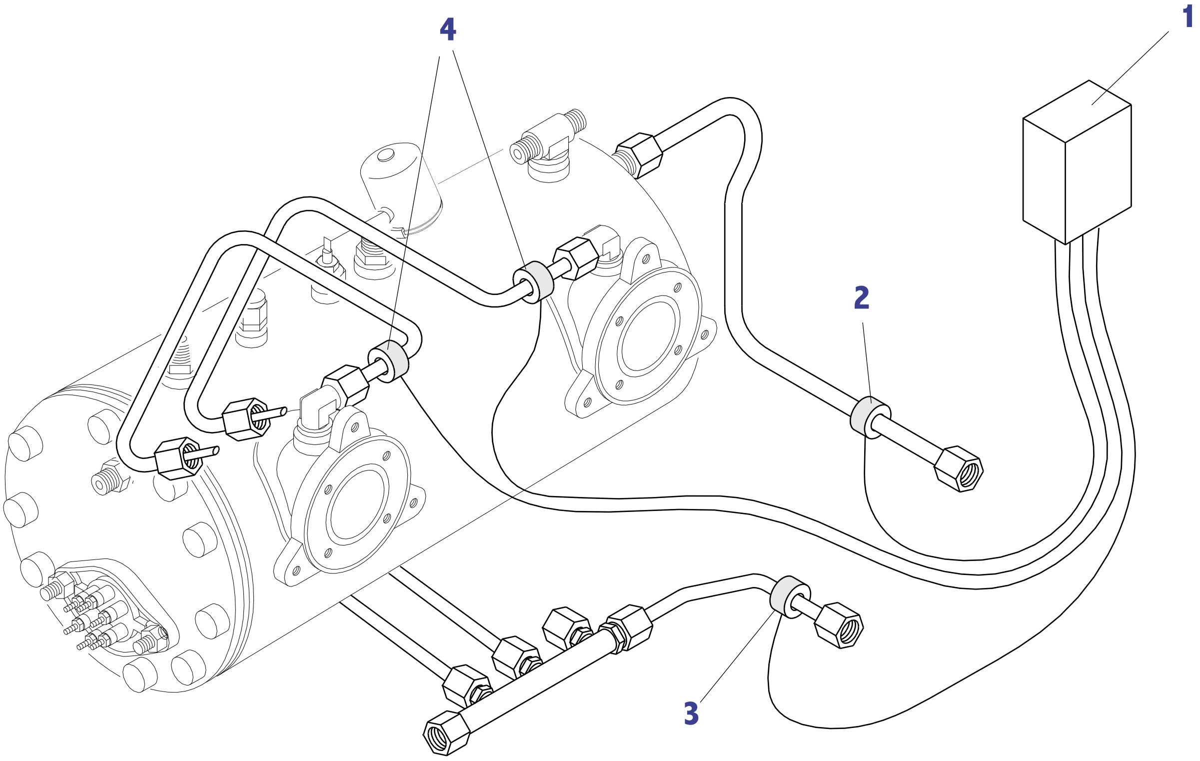
13.2 MULTIHEAD ANTI-LIME SCALE

The operating characteristics of the electronic anti-lime scale device do not alter the biological and chemical properties of the water. In fact, whereas the resin softener acts directly on the water by "capturing" the dissolved calcium ions, the electronic anti-lime scale device acts indirectly on the water through an electromagnetic system.

- Two positive and negative poles are created on a point of the hydraulic system through the application of a magnetic wave emitter which encases the tube externally, and is powered by a low voltage generator.
- The water that passes through this tube is subjected to the action of the magnet. The calcium ions contained in the water implode when they pass through this magnetic field and are transformed to calcite, no longer in aragonite.

This system is convenient and effective as long as the magnetic collars are located in the correct positions of the hydraulic system. An approximate diagram is shown below:

- at the water filling inlet of the boiler
- at the water inlet of the exchangers
- at the water inlet of the delivery group



1 low voltage power supply unit

2 water inlet to boiler

3 water inlet to exchangers

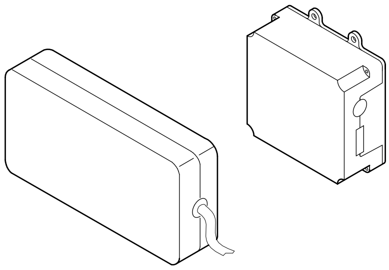
4 water inlet to delivery groups

NOTE

The diagram shown above is to be considered only approximate. The installation of the Multihead system is specific to each type of hydraulic system and version of machine.
It is advisable for the Multihead system to be installed directly by the manufacturer, since it is necessary to perform testing of the magnetic field with special measuring instrumentation.

14. ELECTRONIC CONTROL UNIT

The electronic control unit is installed on machines with volumetric dosing. Its purpose is to control the dose of coffee electronically by means of the water flowing through the dosing device and to check filling of the water entry in the boiler.
This control unit is set up to be connected to the delivery accounting systems by means of a specific interface device.

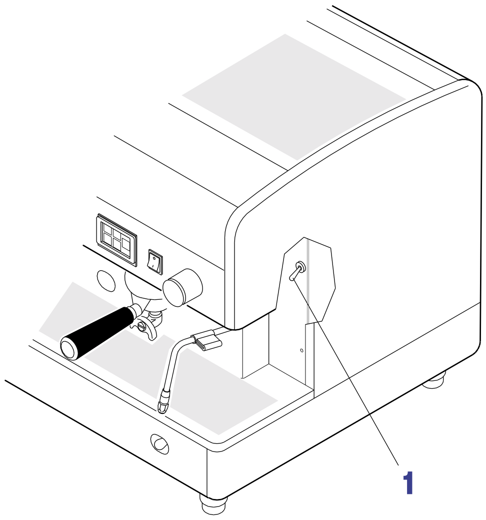


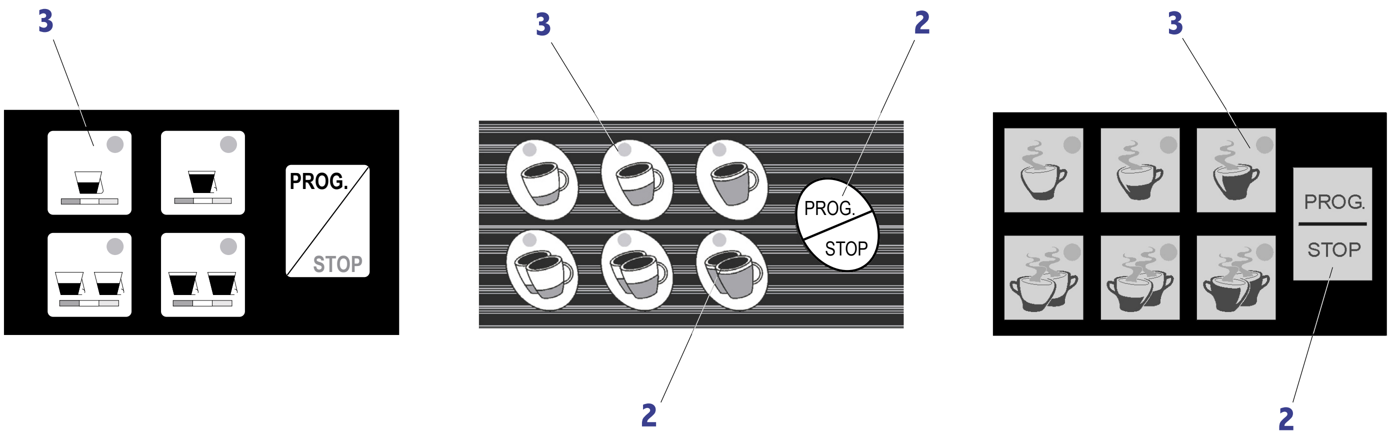
15. ELECTRONIC PUSH BUTTON PANELS

15.1 SAE - SME PUSH BUTTON PANEL

The push button panel is connected to the control unit which allows selection and programming of the doses of coffee.
Programming is carried out in the following way:

- Place the programming lever **(1)** in the ON position. It is located under the front right-hand panel of the body;
- put the coffee cup under the dispensing spout.
- press the PROG/STOP key **(2)** and all dose key LED will come on;
- press the desired dose key **(3)**;
- when the desired dose has been attained, confirm by pressing the PROG/STOP key **(2)**;
- Repeat this operation for the other dose keys.
- upon completion of programming, place the programming lever **(1)** back in the OFF position.





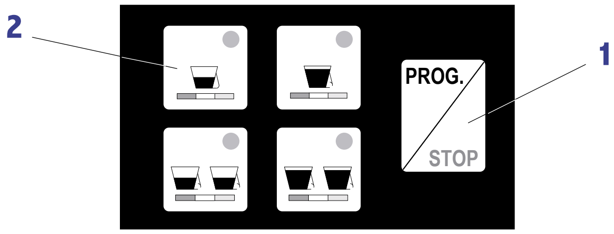
In some models, the programming lever has been eliminated because to access program, and it is enough to press the PROG/STOP key for at least 5 seconds with all push button panel LED coming on. Also, confirmation of the dose can be given by pressing either the PROG/STOP key or the selected dose key.
In other models (for example GLORIA), to access programming it is necessary to use a special key switch.
To exit programming it is sufficient to wait a few seconds.

NOTE
The programming of every dose must be done with ground coffee and not with previously used grounds.
With machines having two or three groups, by first programming the right-hand push buttons the others are automatically programmed. It is however both possible and advisable to program the push button panels independently, always starting from the right-hand push button panel.

15.2 TH JUNIOR PUSH BUTTON PANEL

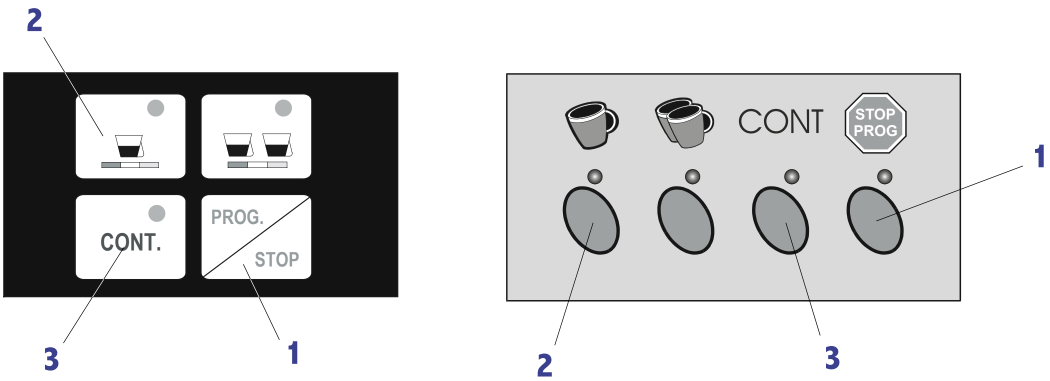
This push button panel is installed mainly on JUNIOR models and on some SAE-SME volumetric dosing machines.
Programming is carried out in the following way:

- put the coffee cup under the dispensing spout.
- Press the PROG/STOP key **(1)** for at least 5 seconds until all dose key LED are on.
- Press the desired dose key **(2)**.
- To confirm the dose press the dose key **(2)** or the PROG/STOP key again **(1)**.
- Repeat this operation for the other dose keys.
- Programming will be terminated automatically after a few seconds.

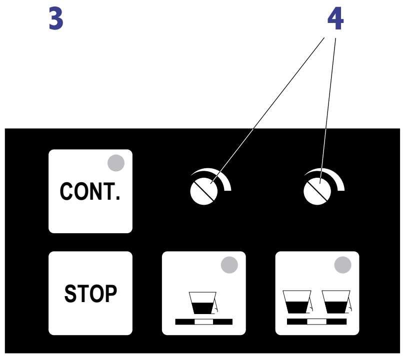


15.3 AEAP - SMAT TIMER PUSH BUTTON PANEL

1) Press and hold down the STOP/PROG key **(1)** for 5 seconds and check that all of the LED on the push button panel come on. This confirms correct entry into the programming phase.
2) Press on of the two dose keys **(2)** to program. The LED corresponding to the CONT key (continue) and to the key of the dose being programmed stay on.
3) When the desired amount of coffee in the cup has been reached, press the STOP/PROG key **(1)** or the key of the dose being programmed to stop delivery and memorize the new value (the duration of the dose of coffee is calculated in seconds). At the same time, the LED for the dose which is still to be programmed comes back on, while the LED for the programmed dose stays off.
4) Proceed with the programming of the other coffee dose by pressing the other dose key. Once the desired amount of coffee in the cup has been reached, press the dose key or the STOP/PROG again **(1)**.
5) To exit programming, press and hold down the STOP/PROG **(1)** key for more than 5 seconds.



In some previous versions of AEAP-SMAT machines, push button panels are installed with time adjustment by means of a trimmer **(4)**: using a screwdriver to turn clockwise increases delivery time, turning counter-clockwise reduces delivery time.



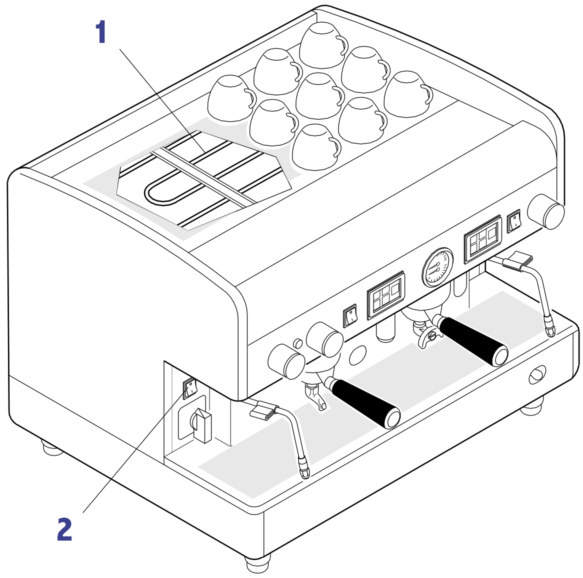
NOTE
It is possible to re-program the coffee dose that you have just finished programming (LED off) without necessarily having to turn the system off and back on or exiting the programming phase.
The system automatically exits programming status approximately 10 seconds after the last operation.

16. CUP HEATING DEVICE

The cup heating device is for heating cups before they are used.

- Place the cups on the upper surface **(1)** of the coffee machine.
- Start the electric heating element with the switch **(2)** or with the push button panel (e.g. SIBILLA - GLORIA).

WARNING
For safety reasons we advise against putting cloths or other objects on the upper surface of the machine as they could obstruct normal air circulation.

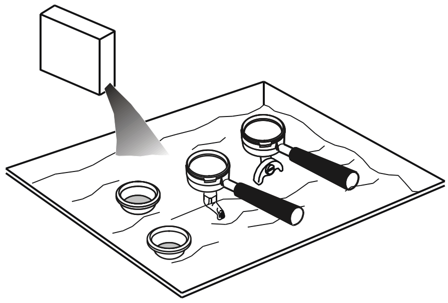


17. CLEANING

For perfect cleaning and efficiency of the appliance, several simple cleaning operations are necessary on the functional parts and accessories as well as the body panels.
The indications given here are applicable for normal use of the coffee machine. If the machine is heavily used then cleaning should be performed more frequently.

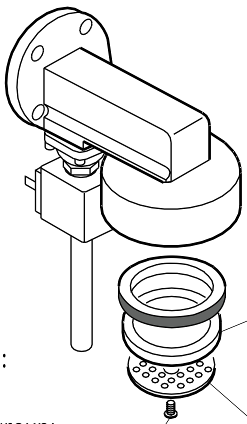
Filter and filter-holder

The filters and the relative filter-holders must be cleaned daily in hot water. The best thing to do is to let them soak in hot water overnight so that the fatty coffee deposits can dissolve.
It is advisable to add an envelope or tablet of special detergent to the water, and then to rinse everything off with water.
Failure to clean the filters and filter holders daily will compromise the quality of the coffee and will also cause problems such as bad extraction and coffee grounds at the bottom of the cup.



Perforated disk and containment ring

Both the shower plate **(4)** and its containment ring **(3)** should be cleaned weekly in hot water. To do this loosen the screw **(5)** and remove the two elements from the dispensing unit.



Steam nozzles

The steam pipes must be kept clean at all times. Check the ends of the steam nozzles and clean them monthly, clearing out the exit holes with a small needle.

Delivery groups (except for AL - SMMA version)

The cleaning of the internal parts of the delivery groups is to be performed weekly in the following manner:

- replace the normal filter of the filter-holder with a solid one;
- pour a teaspoon of a suitable detergent powder on the solid filter, and attach the filter-holder to the group;
- use the delivery switch to set the group in operation;
- repeat the above operations until the water comes out clean;
- turn off and remove the filter-holder from the group;
- rinse a final time, so as to remove any residual detergent.

WARNING
Do not use a solid filter to clean the machines with a lever group (AL-SMMA)

Body

The body panels should be cleaned with a cloth soaked in warm water. Do not use abrasive detergents since the panels could get scratched.

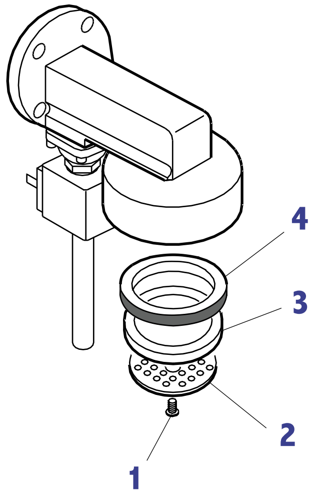
Grinder-doser

Every week clean the bell jar and the dosing device with a cloth soaked in lukewarm water, both inside and out.

18. CHECKS AND MAINTENANCE

To ensure perfect safety and efficiency of the machine over time, it is necessary to carry out routine, preventive and special maintenance. In particular, it is advisable to carry out an overall check of the machine at least once a year.

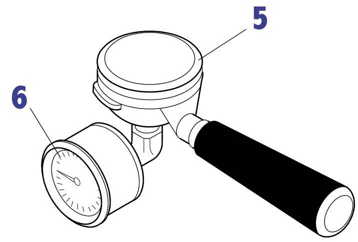
Machine



- Carry out cleaning as described in the previous chapter on a daily basis.
- Every four months replace the perforated disk **(2)** and the undercup seal **(4)** of the delivery group (use only original spare parts) proceeding as follows:
  - loosen the screw **(1)**;
  - remove the containment ring **(3)**;
  - replace the group perforated disk **(2)** and the rubber undercup seal **(4)**;
  - put the components back in place.
- At least once a year, check for proper operation of the negative pressure valve, pressure limiting valve and non-return drain valve. In the event of malfunction they must be replaced. For the checks, proceed as follows:

negative pressure valve
- Turn the machine off;
- by means of the steam valves, release all pressure in the boiler;
- turn the machine back on and check closure of the valve.

pressure limiting valve
- Lock the pressure switch contacts.
- wait for pressure in the boiler to rise and check for intervention of the valve at a maximum pressure of 2 bar.



Non-return drain valve
- Activate the delivery groups for about 30 seconds;
- attach a filter holder **(5)** with a gauge (available on request) to the delivery group;
- activate the delivery group, and use the gauge **(6)** to monitor pressure increase up to 8-9 bar;
- check the increase of pressure due to the expansion of the heated water up to a value of approximately 12 bar: reaching this value confirms proper operation of the valve and the seal of the gaskets and solenoid valves;
- de-activate the deliveries;
- repeat the control on the other delivery groups.

- Periodically check water pressure during coffee delivery. Check the pressure indicated on the gauge, which must be between 8 and 9 bar inclusive.
- Monitor the boiler pressure value as explained in chapter 1, “Technical characteristics”.
- Periodically check the condition of the filters. Check for any damage on the edge of the filters and check whether any coffee grounds settle in the coffee cup.
- At least once a year, check for proper operation of the gauge and pressure switch;
- At least once a year check for lime scale deposits on the heating element, on the exchanger (inside and out) and on the hydraulic circuit. When replacing any components, always replace the relative gasket as well.
- At least once a year, check the condition of the solenoid valve of the delivery group.
- At least once a year check for trace water leaks on the counter. Also check the condition of the discharge tub and its connection to the sewer system.

Grinder-doser

Periodically check the dose of ground coffee (inclusive between 6 and 7 gr. per stroke) and check the degree of grinding. The grinders must always have sharp cutting edges. Their deterioration is indicated by the presence of too much powder in the grounds. It is advisable to replace the grinders after every 400/500 kg of coffee.

Softener

Resin softener: The build-up of lime scale deposits in the hydraulic circuit of the machine indicates that regeneration has been neglected. Carry out maintenance of the boiler and of the hydraulic circuit, replacing any components as required.
Use care in areas where the water is very hard. It will be necessary to regenerate at more frequent intervals; likewise if there is high consumption of hot water for tea and so forth.
Multihead anti-lime scale: Lime scale in the water circuit and in the boiler is a sign that there may be a failure of the electronic control unit and/or of the terminals in the machine.

19. MALFUNCTIONS AND CORRESPONDING SOLUTIONS

Indication	Cause	Solution
NO POWER TO MACHINE	1) The machine commutator is in position "0" or "1" 2) The machine switch is defective 3) The mains power supply switch is in the OFF position 4) The connection to the electrical mains is defective	1) Turn the machine commutator to position "2" 2) Replace the main switch 3) Place the mains switch in the ON position 4) Check for any defective connections
NO WATER IN BOILER	1) The water mains tap is closed 2) The cut-off tap of the automatic level device is in the closed position 3) The pump filter is closed 4) The motor pump is disconnected or blocked 5) The water filling solenoid is defective 6) The water inlet solenoid valve filter is clogged	1) Open the water mains tap 2) Open the automatic level device tap 3) Replace the pump filter 4) Check the motor pump 5) Replace the water filling solenoid valve 6) Clean or replace the filter of the solenoid valve
EXCESSIVE WATER IN BOILER	1) The solenoid of the automatic level device is defective 2) The heat exchanger is perforated 3) The manual valve remains inserted	1) Replace the solenoid valve of the automatic level device 2) Replace the heat exchanger 3) Check the level probe, the earth of the frame and the operation of the electronic control unit
STEAM DOES NOT COME OUT OF NOZZLES	1) The electrical heating element is defective 2) The pressure switch contacts are oxidized 3) The heating element protection thermostat has cut in 4) The nozzle sprayer is clogged 5) Machine switch in position "1"	1) Replace the electrical heating element 2) Clean the contacts or replace the pressure switch 3) Reset the heating element protection 4) Clean the steam nozzle sprayer 5) Turn the machine switch to position "2"
STEAM MIXED WITH WATER COMES OUT OF THE NOZZLES	1)The boiler level is too high	1) Check the status of the level probe: verify correct position and check for presence of any surface lime scale
NO DELIVERY	1) No water mains 2) Group solenoid valve is defective 3) The pump is blocked 4) The control unit fuse is burned out 5) The injector is clogged 6) The group solenoid valve is clogged or dirty 7) The group filter is clogged 8) The volumetric dosing device is blocked	1) Check that there is water in the mains 2) Replace the group solenoid valve 3) Replace the pump 4) Replace the solenoid valve protection fuse (1A) 5) Clean or replace the injector 6) Clean or replace the solenoid valve 7) Clean or replace the filter 8) Check/replace the dosing device
WATER LEAKS FROM THE MACHINE	1) The tub does not drain 2) The drain tube is detached or broken or has obstruction to water flow 3) Hydraulic leaks in the hydraulic circuit	1) Check the sewer drain 2) Check and restore the connection of the drain tube to the tub 3) Identify and eliminate hydraulic leaks
COFFEE IS TOO COLD	1) The electrical heating element is defective 2) The electrical connection is defective 3) Lime scale on the exchangers and/or heating element 4) The pressure switch contacts are oxidized 5) The heating element protection thermostat has cut in 6) Machine switch in position "1" 7) In the CTS system, the lime scale has reduced the circulation of water 8) The delivery group is cold	1) Replace the electrical heating element 2) Check for any defective connections 3) Clean the machine 4) Clean the contacts or replace the pressure switch 5) Reset the heating element protection 6) Turn the machine switch to position "2" 7) Clean the connections of the exchanger, and clean or replace the two circulation tubes 8) Eliminate air pockets in the hydraulic circuit in the following manner: - disconnect the electrical power supply to the pump - close the water tap of the softener - perform a dry run of delivery for a few minutes - reconnect the electrical power supply to the pump - open the water outlet tap of the softener - perform delivery until water comes out - wait a few minutes for heating

Indication	Cause	Solution
COFFEE IS TOO HOT	1) Boiler temperature is too high 2) The flow reducer of the group is not suitable	1) Reduce pressure in the boiler by turning the appropriate screw on the pressure switch 2) Replace the injector with one of a smaller diameter
DELIVERY OF COFFEE IS TOO FAST	1) The coffee is ground too coarsely 2) The diameter of the injector is too large 3) Boiler temperature is too high	1) Adjust the grinding of the coffee 2) Replace the injector with one of a smaller diameter 3) Reduce pressure in boiler
DELIVERY OF COFFEE TOO SLOW	1) Coffee is ground too finely 2) The injector is clogged 3) The delivery group is clogged 4) The filter holder is dirty	1) Adjust the grinding of the coffee 2) Replace the injector 3) Check and clean the delivery group 4) Clean and if necessary replace the filters
COFFEE GROUNDS ARE WET	1) The group solenoid valve discharge is clogged 2) The delivery group is too cold 3) Coffee is ground too finely	1) Clean the group drain 2) Wait for group to heat up completely 3) Adjust the grinding of the coffee
THE GAUGE SHOWS AN UNACCEPTABLE PRESSURE	1) The gauge is defective 2) Incorrect pressure switch calibration. 3) Incorrect motor pump calibration.	1) Replace the gauge 2) Adjust the calibration of the pressure switch 3) Adjust the calibration of the motor pump
GROUNDS IN CUP	1) The filter holder is dirty 2) The filter holes are worn 3) The coffee is not ground evenly 4) The undercup seal is worn 5) The temperature of the delivery water is high	1) Clean the filter holder 2) Replace the filter 3) Replace the grinders 4) Change the seal 5) Check the causes and eliminate the problem
for SAE-SME: COFFEE DELIVERY ONLY BY MEANS OF MANUAL KEY	1) The control unit fuse is burned out 2) The coil of the solenoid valve does not work correctly or has shorted out	1) Replace the control unit fuse (1A) 2) Replace the coil of the solenoid valve
for SAE-SME: INCORRECT COFFEE DELIVERY THE COFFEE DOSE IS NOT MET THE LED OF THE DOSE PUSH BUTTON FLASHES	1) The connection of the volumetric dosing device is defective 2) The connection of the electronic control unit is defective 3) The connector of the volumetric dosing device has humidity on it 4) The volumetric dosing device is defective: during delivery the dosing device LED does not flash 5) The coffee is ground too finely: there is not sufficient water flow in the dosing device 6) The non-return valve loses pressures (the dose is too small) 7) The drain valves lose pressure (the dose is too small) 8) Water leakage from the group solenoid valve during coffee delivery or when at rest 9) The volumetric dosing device is partially obstructed	1) Check for proper connection of the volumetric dosing device connector 2) Check for proper connection of the 8-pole connector of the electronic control unit 3) Remove the connector of the volumetric dosing device and thoroughly dry the contacts 4) Replace the heads of the volumetric dosing device or replace the dosing device 5) Adjust the grinding suitably and if necessary check the grinders 6) Check and if necessary replace the non-return valve 7) Check and if necessary replace the drain valves 8) Clean and if necessary replace the solenoid valve 9) Clean or replace the volumetric dosing device
for SAE-SME: ALL THE LED OF ALL THE PUSH BUTTON PANELS FLASH for AEP-SMSA AEAP-SMAT: THE FRONT LED FLASHES	After a few minutes, automatic filling with water is stopped: 1) Time control device has cut in 2) No water in mains 3) The tap for the automatic level device is closed 4) Some of the tubes in the circuit are clogged 5) The probe and/or the earth are disconnected	1) Turn the machine off and then back on 2) Open the water mains tap 3) Open the automatic level device tap 4) Check and replace the defective tubes 5) Check and restore connections

Indication	Cause	Solution
THE PUMP WORKS ONLY WITH THE MANUAL DELI-VERY KEY	1) The pump fuse of the electronic control unit is burned out	1) Replace pump fuse of the electronic control unit (10 A)
SHUTDOWN OF ELECTRONIC SYSTEM	1) The control unit fuse is burned out 2) The volumetric dosing device has a contact of the positive pole to the earth	1) Replace the main fuse (125 mA) 2) Check for proper connection of the volumetric dosing device
THE PUMP LEAKS WATER	1) Poor mechanical seal of the shaft or of the O-ring 2) The inlet and outlet connections are loose 3) The hex nut of the pressure relief valve or of the filter are loose 4) The gasket or the O-ring of the pressure relief valve or of the filter are defective.	1) Check the status of the pump and take any corrective action which may be required 2) Tighten the connections 3) Tighten the hex connection of the modulating valve and of the filter 4) Replace the gasket and the O-ring. Take care not to change the calibration of the valve
THE MOTOR STOPS SUDDENLY OR THE THERMAL PROTECTION CUTS IN DUE TO AN OVERLOAD	1) Lime scale and mineral build-ups in the pump have caused it to jam 2) The pump and the engine are not aligned. 3) The motor is defective 4) The motor is connected with a voltage that is not correct	1) Check the status of the pump and if necessary replace it 2) Install the pump-motor joint 3) Replace the motor 4) Ascertain that the power supply voltage of the motor is the right one
THE PUMP FUNCTIONS BELOW THE NOMINAL CAPACITY	1) The inlet is clogged, perhaps only partially 2) The pump rotates in the wrong direction. 3) The pressure relief valve is not properly calibrated 4) The motor runs at low RPM 5) The inside of the pump is damaged due to the infiltration of foreign bodies	1) Clean the filter holder 2) Check the motor 3) Calibrate the pressure relief valve 4) Check the voltage or replace the motor 5) Replace the pump
THE PUMP IS NOISY	1) The pump and the engine are not aligned. 2) The gasket or the O-ring of the pressure relief valve or of the filter are defective. 3) The joint, the coupling screw or the V-shaped clamp are loose. 4) The inlet is clogged, perhaps only partially 5) The hex nut of the pressure relief valve or of the filter is loose	1) Install the pump-motor joint 2) Replace the gasket and the O-ring. Take care not to change the calibration of the valve 3) Align and tighten the components which are loose 4) Clean the filter holder 5) Tighten the hex connection of the pressure relief valve and of the filter
THE CUP IS DIRTIED BY SPLASHES OF COFFEE	1) Steam pockets in the delivery system 2) Air pockets in the hydraulic circuit 3) Coffee is ground too finely 4) The flow reducer of the group is not suitable	1) Reduce water temperature 2) Check the cause and eliminate the problem 3) Adjust the grinding suitably 4) Replace the flow reducer

20. LIST OF HAZARDS

This chapter describes possible hazards for the user if the specific safety standards described in this booklet are not adhered to.

The appliance must be connected to an efficient grounding system

If this is not done, the appliance can be a source of dangerous electrical discharges in that it is no longer able to discharge electricty to earth.

Do not use running water to wash

The use of pressurized water directly on the machine can seriously damage electrical appliances. Never use water jets to wash any part of the appliance.

Be careful with the steam nozzles and hot water

During use, the steam nozzles and hot water may overheat, thus becoming a source of danger. Handle such parts carefully. Never direct steam or hot water jets directly on parts of the body.

Do not intervene on the machine when it is supplied with electrical power.

Before carrying out any intervention on the machine you must turn it off by means of the main network switch or better yet, disconnecting the connection terminals in the network. Never remove any body panel when the machine is supplied with electrical power.

Never work on the hydraulic system before having emptied it.

All work regarding the hydraulic system and the relative boiler are to be avoided when there is still water and pressure in the system. You must therefore empty it beforehand, closing the mains cock and dry-running the delivery group for a short time. Switch off the machine and open all the steam and water cocks and taps. With the pressure zero, completely empty the boiler, unscrewing the special pipe fitting situated on the lower part of it.

If the above procedure is not correctly carried out, opening any part of the hydraulic system can cause a sudden outlet of overheated water under pressure.

Lever machines

Never lower the lever if there is no coffee in the filter, or if the filter holder is not installed on the group: the sudden upwards movement of the lever may damage the appliance and injure individuals.

Gas machines

Periodically check for gas leaks in the system by applying a soapy solution to the ducts.

For safety reasons, close the gas heating system when the machine is not in use (at night or during hours of closure)

Use of the appliance

This espresso coffee machine is an appliance exclusively for professional use. Any other type of use is considered wrong and therefore dangerous. Never allow children or incapable persons to use the machine.

Non-observance of the above-described standards can cause serious damage to people or animals.

Never work on the electronic apparatus when the machine is still supplied with electrical energy.

Shut down the machine completely by unplugging it from the mains before carrying out any operation.

WARNING

Any action taken by a technician on the electronics of the machine when the machine is still supplied with electrical power automatically invalidates any guarantee.
The technician needs to be aware that the machine is electrically connected and act accordingly.

ESPRESSO COFFEE MACHINE

USE AND MAINTENANCE MANUAL

Instructions for the technician

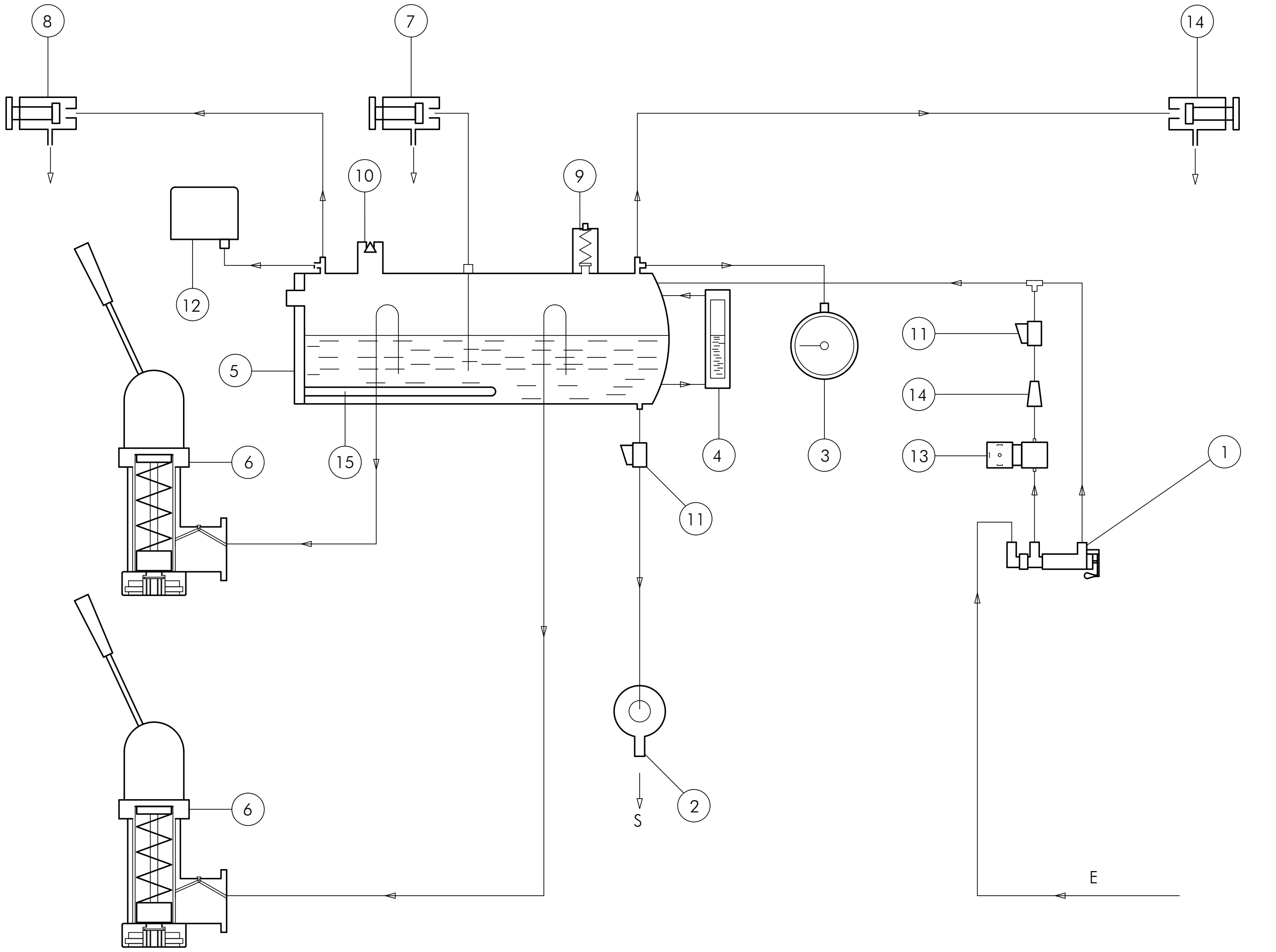
HYDRAULIC DIAGRAMS

ENGLISH

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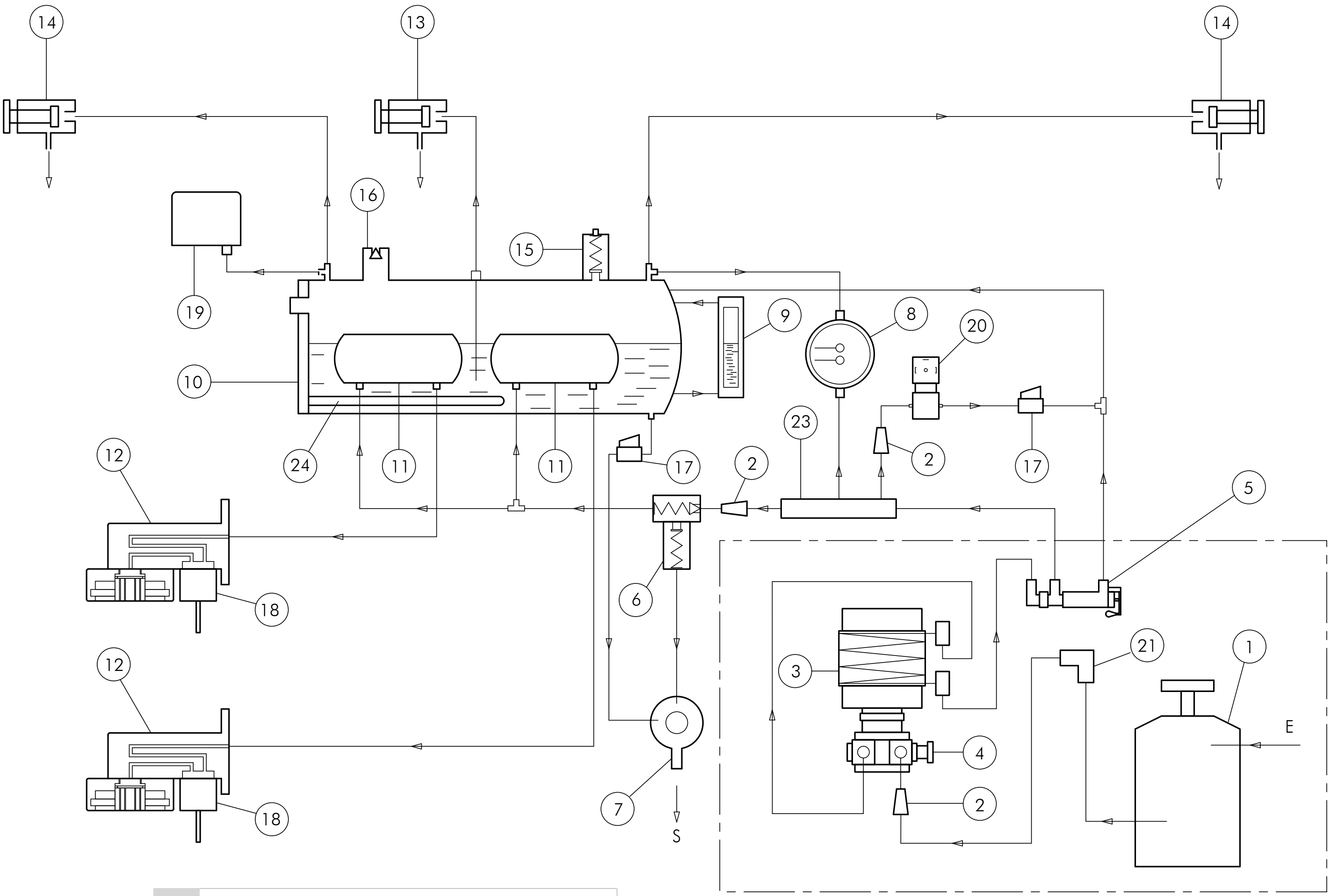
Summary

1. LEVER GROUP hydraulic diagram

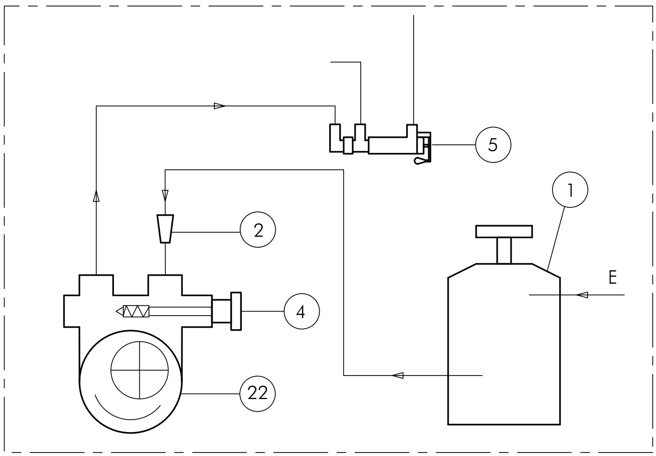


1	Manual water inlet tap
2	Drain tub
3	Gauge
4	Boiler level-check window
5	Boiler
6	Delivery group
7	Hot water tap
8	Steam tap
9	Safety valve
10	Negative pressure valve
11	Tap
12	Pressure switch
13	Automatic Water Inlet Solenoid Valve (optional)
14	Water inlet filter
15	Boiler heating element
E	Water inlet
S	Drain

2. AEP-SMSA CARTRIDGE EXCHANGER hydraulic diagram



Internal motor pump

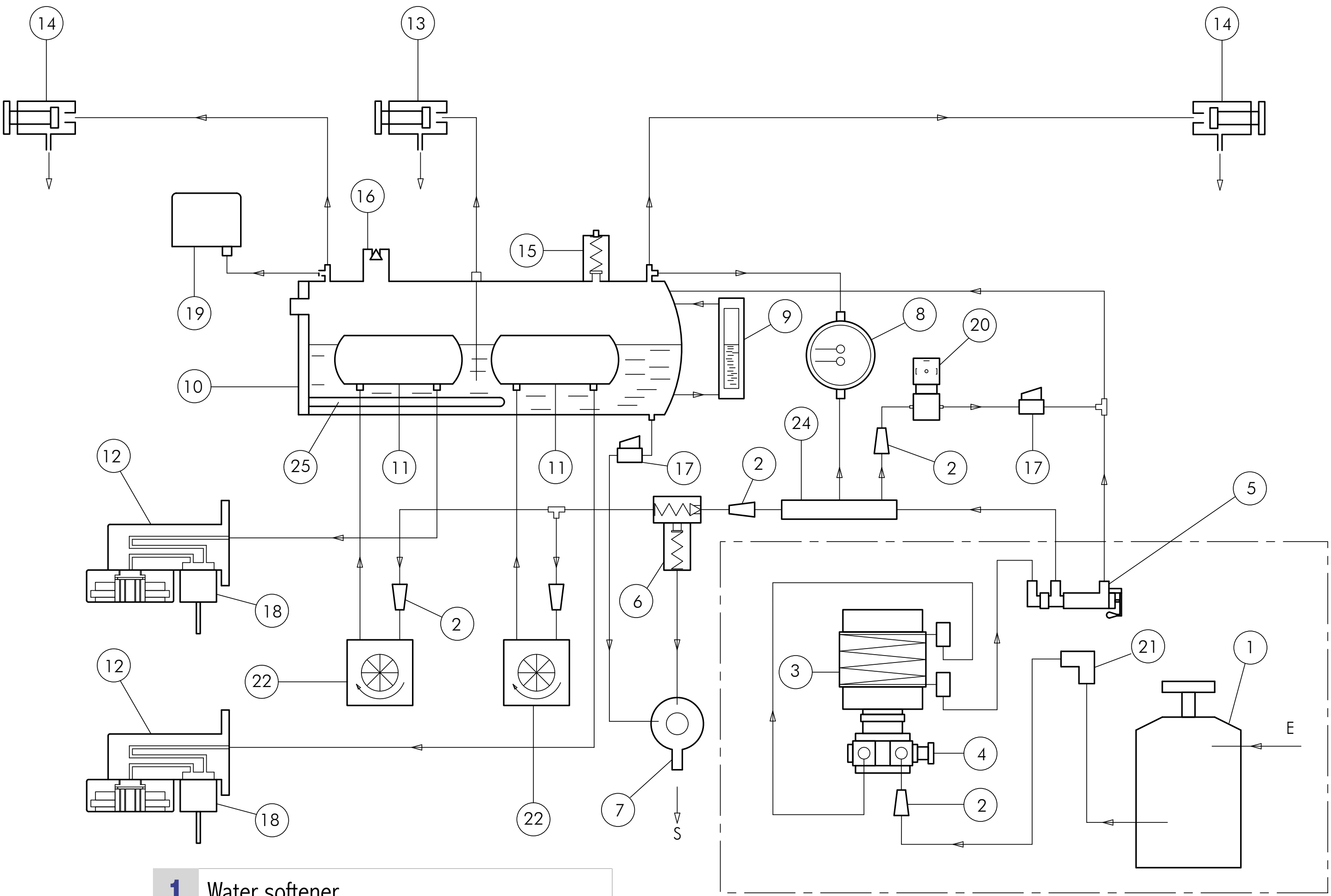


External motor pump

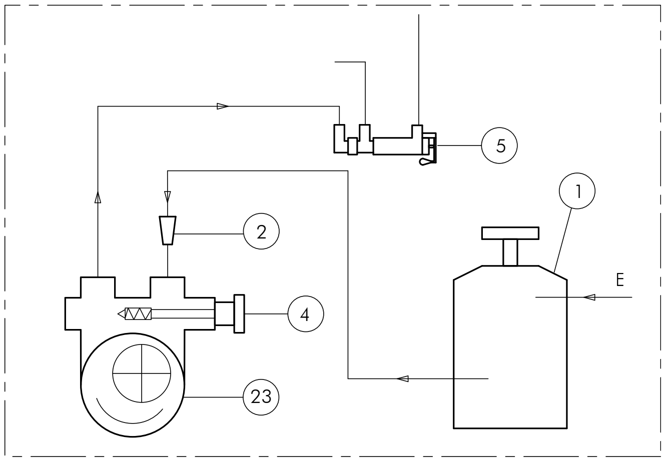
1	Water softener
2	Water inlet filter
3	Built-in motor pump
4	Pump pressure adjustment
5	Manual water inlet tap
6	SCNR valve
7	Drain tub
8	Gauge
9	Level-check window
10	Boiler
11	Heat exchanger
12	Delivery group
13	Hot water tap
14	Steam tap
15	Safety valve
16	Negative pressure valve
17	Boiler drain tap
18	Group solenoid valve
19	Pressure switch
20	Automatic Water Inlet Solenoid Valve
21	Water inlet connection
22	External motor pump
23	Water distributor
24	Boiler heating element

E	Water inlet
S	Drain

3. SAE-SME CARTRIDGE EXCHANGER hydraulic diagram



Internal motor pump

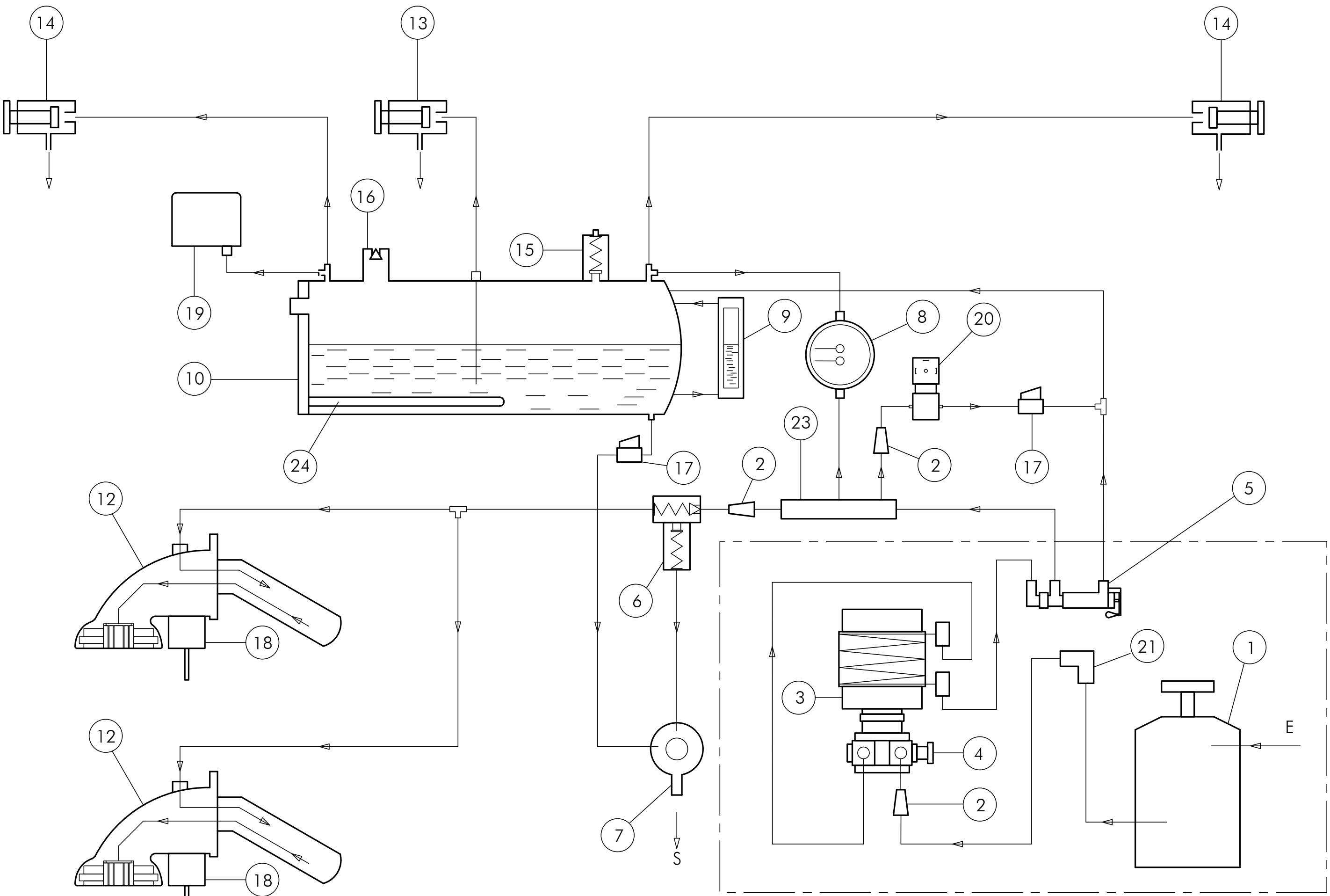


External motor pump

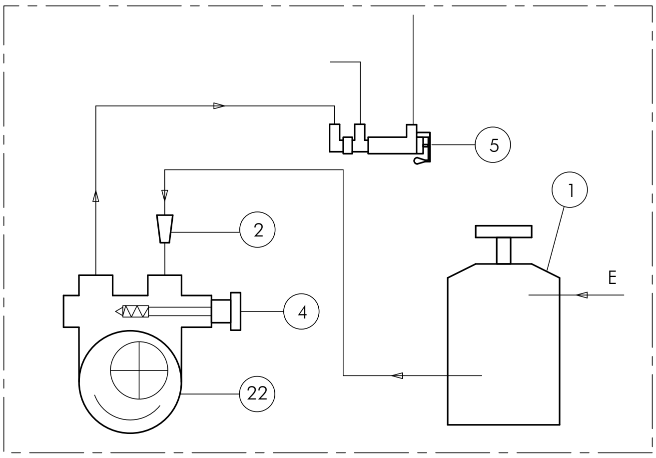
1	Water softener
2	Water inlet filter
3	Built-in motor pump
4	Pump pressure adjustment
5	Manual water entry tap
6	SCNR valve
7	Drain tub
8	Gauge
9	Level-check window
10	Boiler
11	Heat exchanger
12	Delivery group
13	Hot water tap
14	Steam tap
15	Safety valve
16	Negative pressure valve
17	Boiler drain tap
18	Group solenoid valve
19	Pressure switch
20	Automatic Water Inlet solenoid valve
21	Water inlet connection
22	Volumetric dosing device
23	External motor pump
24	Water distributor
25	Boiler heating element

E	Water inlet
S	Drain

4. AEP-SMSA EXTRACTABLE EXCHANGER hydraulic diagram



Internal motor pump

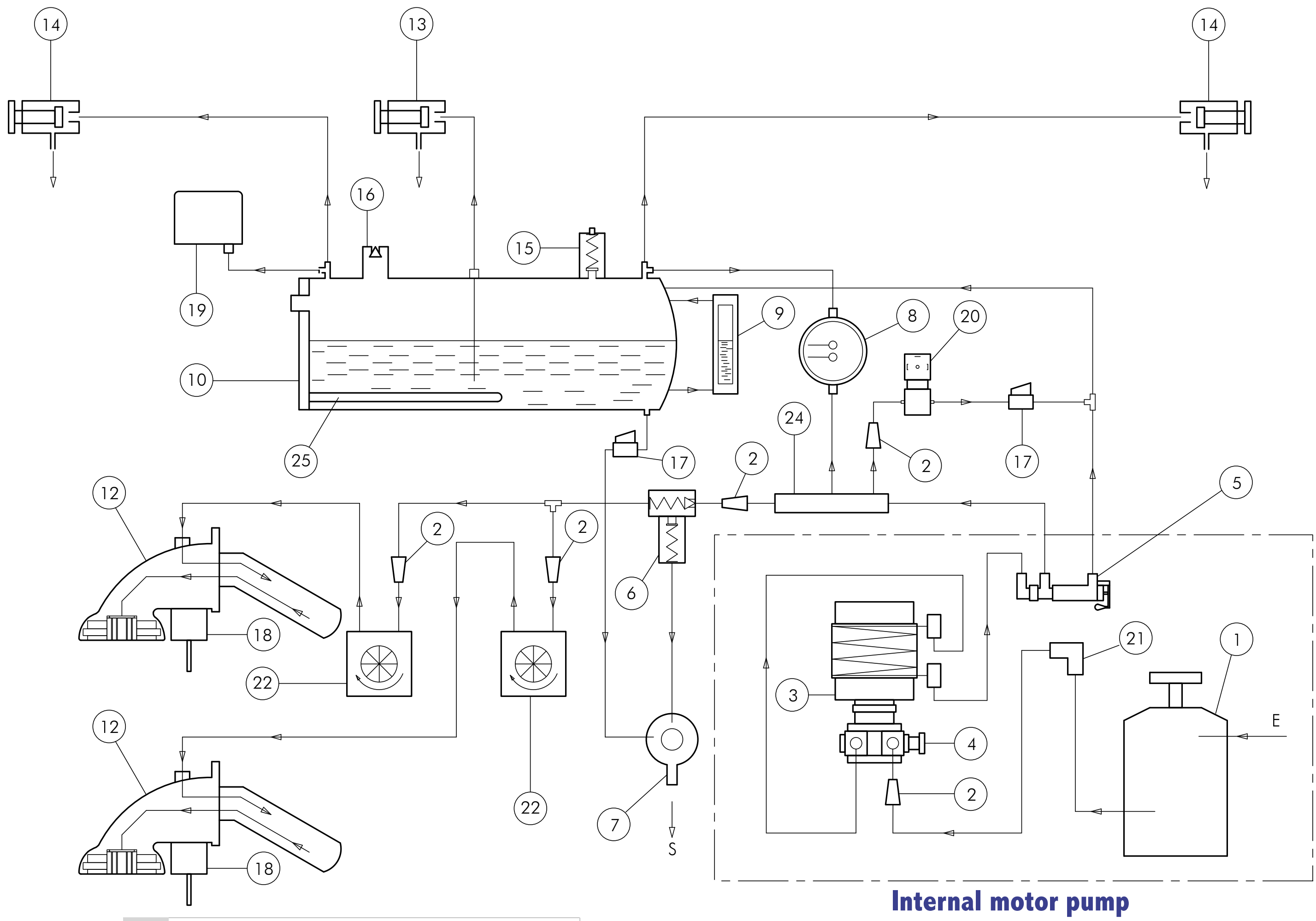


External motor pump

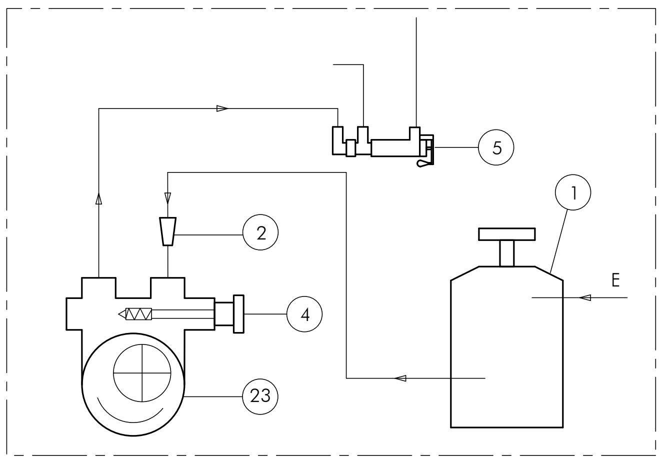
1	Water softener
2	Water inlet filter
3	Built-in motor pump
4	Pump pressure adjustment
5	Manual water entry tap
6	SCNR valve
7	Drain tub
8	Gauge
9	Level-check window
10	Boiler
11	Heat exchanger
12	Delivery group
13	Hot water tap
14	Steam tap
15	Safety valve
16	Negative pressure valve
17	Boiler drain tap
18	Group solenoid valve
19	Pressure switch
20	Automatic Water Inlet solenoid valve
21	Water inlet connection
22	Water distributor
23	External motor pump
24	Boiler heating element

E	Water inlet
S	Drain

5. SAE-SME EXTRACTABLE EXCHANGER hydraulic diagram



Internal motor pump

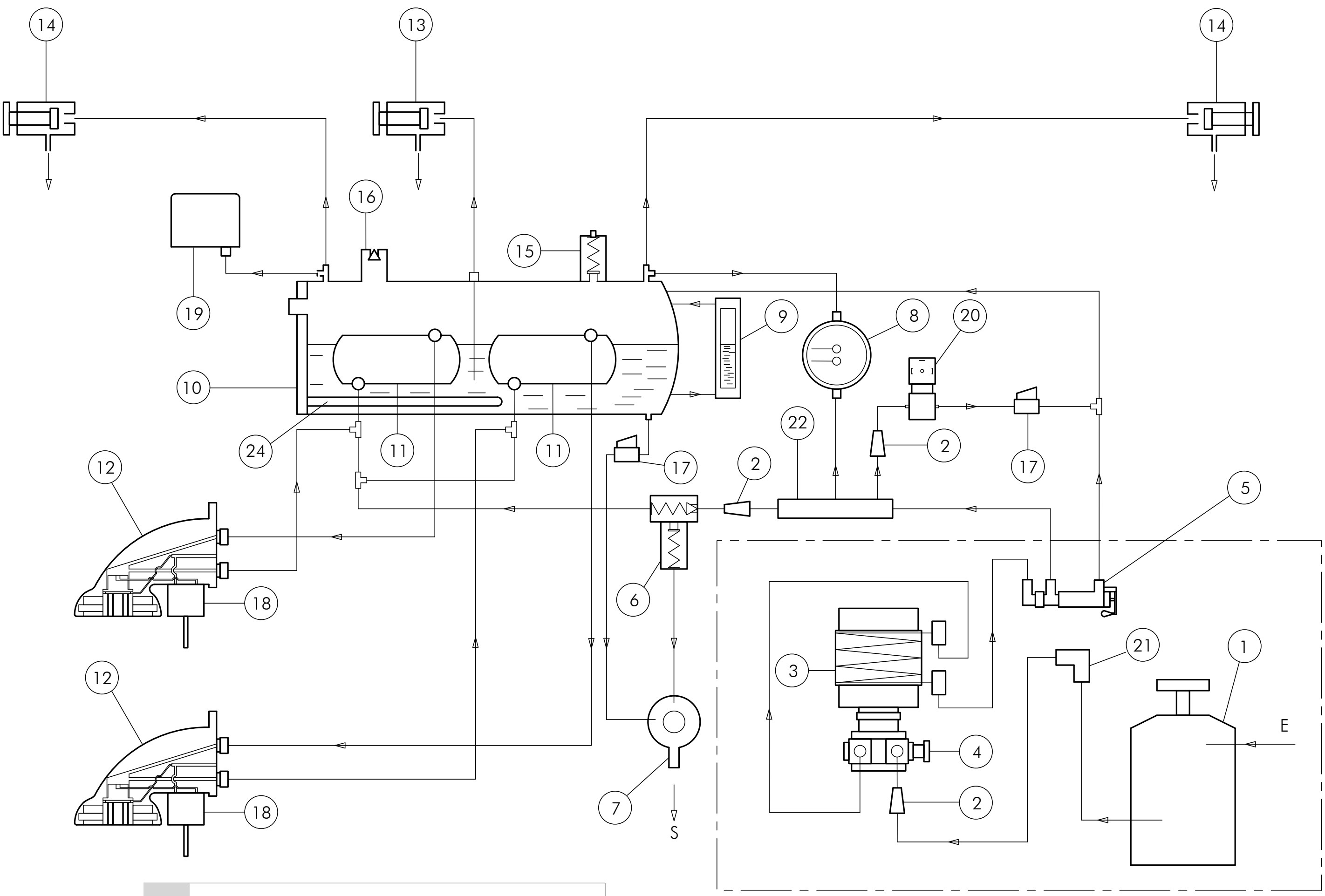


External motor pump

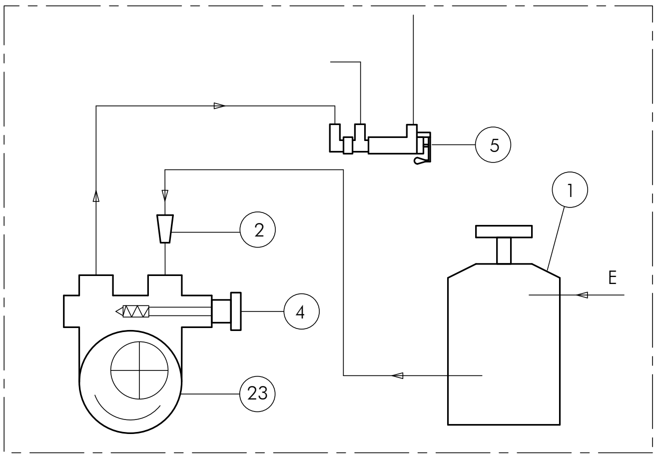
1	Water softener
2	Water inlet filter
3	Built-in motor pump
4	Pump pressure adjustment
5	Manual water entry tap
6	SCNR valve
7	Drain tub
8	Gauge
9	Level-check window
10	Boiler
11	Heat exchanger
12	Delivery group
13	Hot water tap
14	Steam tap
15	Safety valve
16	Negative pressure valve
17	Boiler drain tap
18	Group solenoid valve
19	Pressure switch
20	Automatic Water Inlet solenoid valve
21	Water inlet connection
22	Volumetric dosing device
23	External motor pump
24	Water distributor
25	Boiler heating element

E	Water inlet
S	Drain

6. AEP-SMSA CTS system hydraulic diagram



Internal motor pump

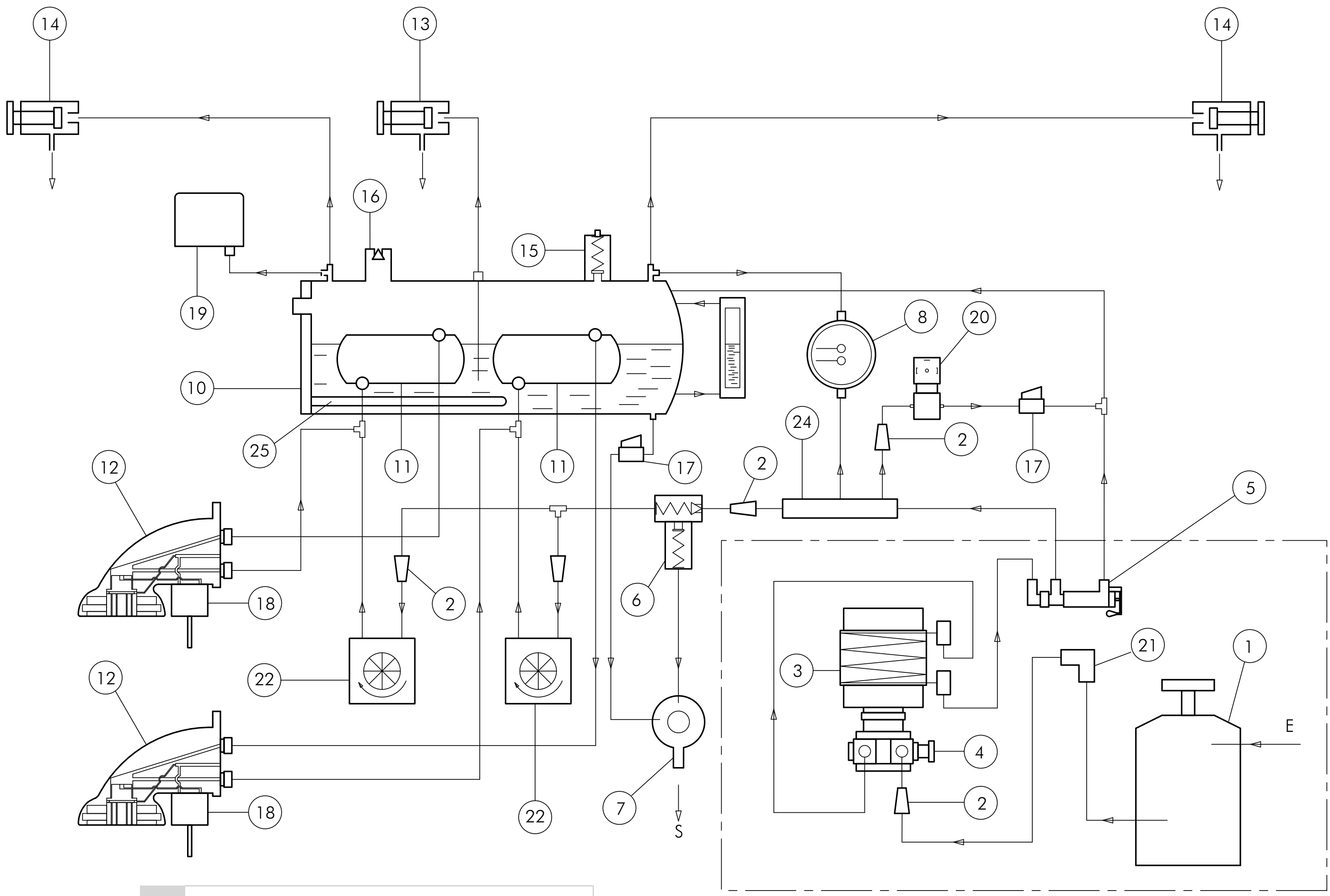


External motor pump

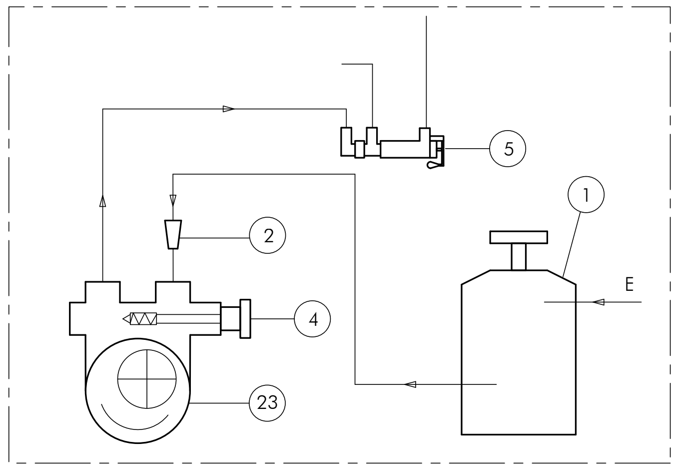
1	Water softener
2	Water inlet filter
3	Built-in motor pump
4	Pump pressure adjustment
5	Manual water entry tap
6	SCNR valve
7	Drain tub
8	Gauge
9	Level-check window
10	Boiler
11	Heat exchanger
12	Delivery group
13	Hot water tap
14	Steam tap
15	Safety valve
16	Negative pressure valve
17	Boiler drain tap
18	Group solenoid valve
19	Pressure switch
20	Automatic Water Inlet solenoid valve
21	Water inlet connection
22	Water distributor
23	External motor pump
24	Boiler heating element

E	Water inlet
S	Drain

7. SAE-SME CTS system hydraulic diagram



Internal motor pump

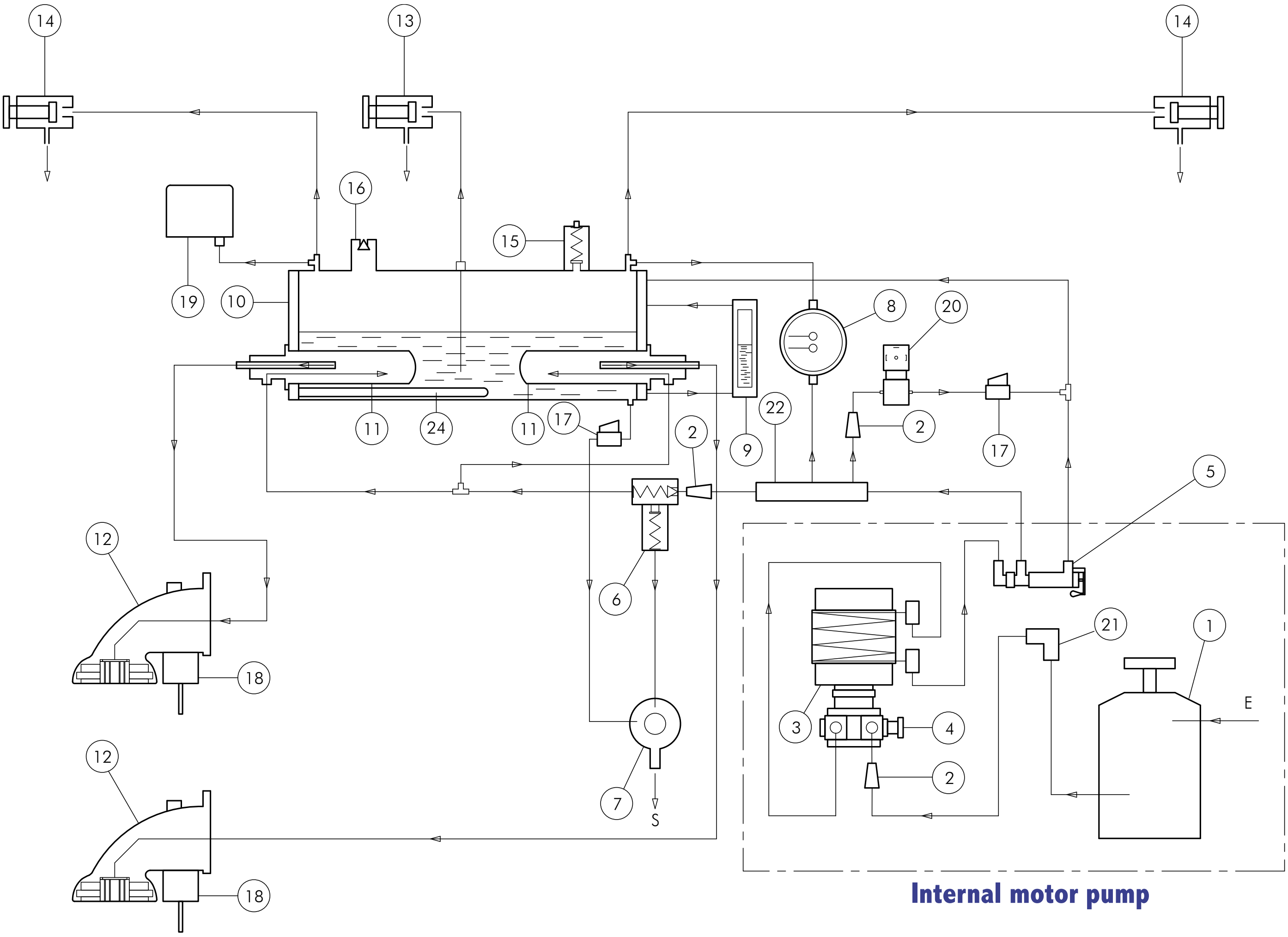


External motor pump

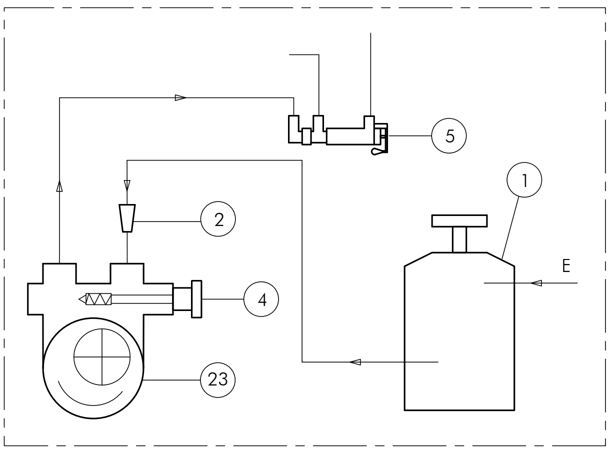
1	Water softener
2	Water inlet filter
3	Built-in motor pump
4	Pump pressure adjustment
5	Manual water entry tap
6	SCNR valve
7	Drain tub
8	Gauge
9	Level-check window
10	Boiler
11	Heat exchanger
12	Delivery group
13	Hot water tap
14	Steam tap
15	Safety valve
16	Negative pressure valve
17	Boiler drain tap
18	Group solenoid valve
19	Pressure switch
20	Automatic Water Inlet solenoid valve
21	Water inlet connection
22	Volumetric dosing device
23	External motor pump
24	Water distributor
25	Boiler heating element

E	Water inlet
S	Drain

8. AEP-SMSA BOOSTED SYSTEM system hydraulic diagram



Internal motor pump

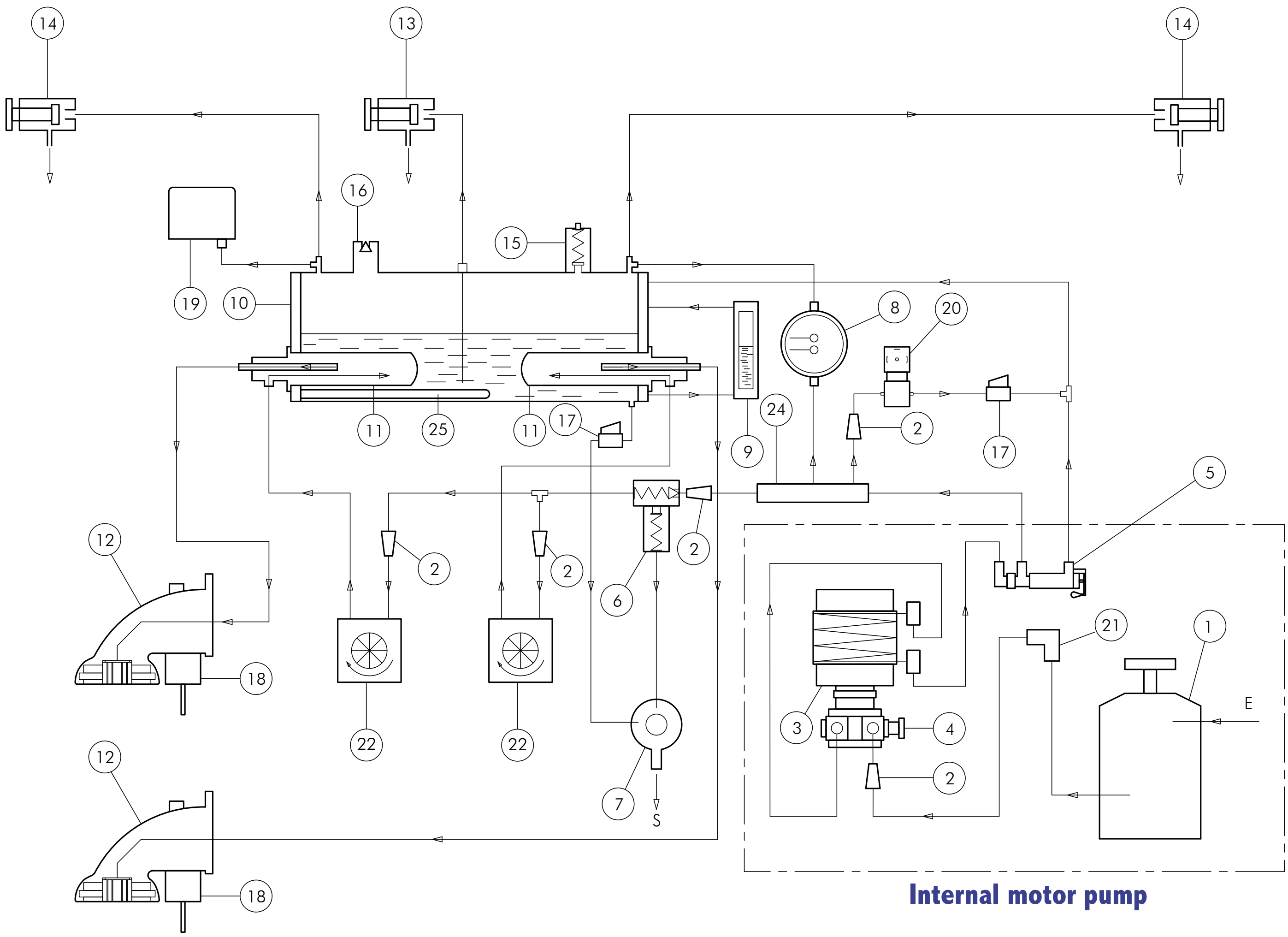


External motor pump

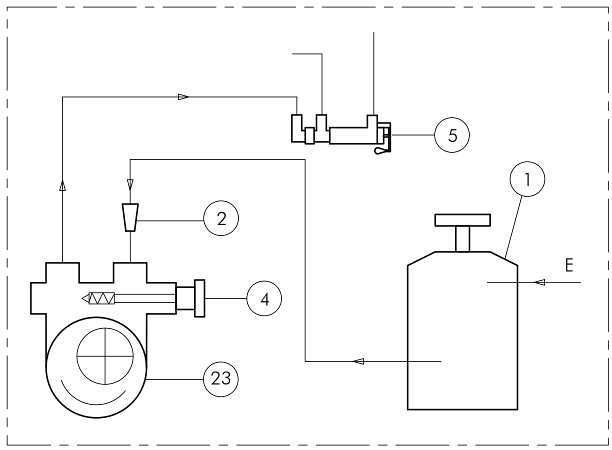
1	Water softener
2	Water inlet filter
3	Built-in motor pump
4	Pump pressure adjustment
5	Manual water entry tap
6	SCNR valve
7	Drain tub
8	Gauge
9	Level-check window
10	Boiler
11	Heat exchanger
12	Delivery group
13	Hot water tap
14	Steam tap
15	Safety valve
16	Negative pressure valve
17	Boiler drain tap
18	Group solenoid valve
19	Pressure switch
20	Automatic Water Inlet solenoid valve
21	Water inlet connection
22	Water distributor
23	External motor pump
24	Boiler heating element

E	Water inlet
S	Drain

9. SAE-SME BOOSTED SYSTEM hydraulic diagram



Internal motor pump



External motor pump

1	Water softener
2	Water inlet filter
3	Built-in motor pump
4	Pump pressure adjustment
5	Manual water entry tap
6	SCNR valve
7	Drain tub
8	Gauge
9	Level-check window
10	Boiler
11	Heat exchanger
12	Delivery group
13	Hot water tap
14	Steam tap
15	Safety valve
16	Negative pressure valve
17	Boiler drain tap
18	Group solenoid valve
19	Pressure switch
20	Automatic Water Inlet solenoid valve
21	Water inlet connection
22	Volumetric dosing device
23	External motor pump
24	Water distributor
25	Boiler heating element

E	Water inlet
S	Drain

ESPRESSO COFFEE MACHINE

USE AND MAINTENANCE MANUAL

Instructions for the technician

ELECTRICAL DIAGRAMS

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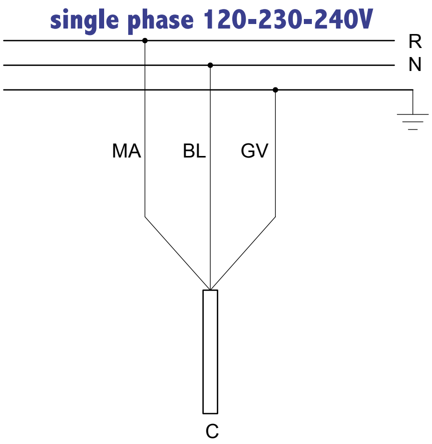
Review

Rev 02 - 01/2005 - General review

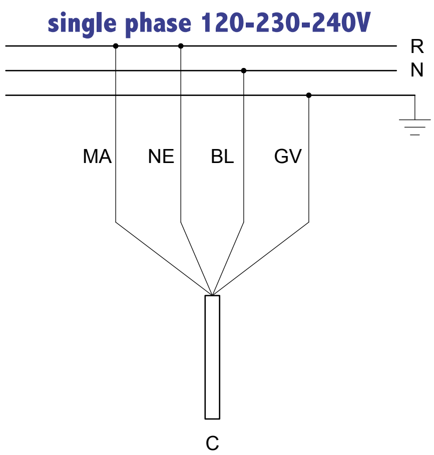
Rev 03 - 05/2005 - New capter 6.13 rev.1 PLUS 1 e 2 rev.01
- New capte 6.14 PLUS 3

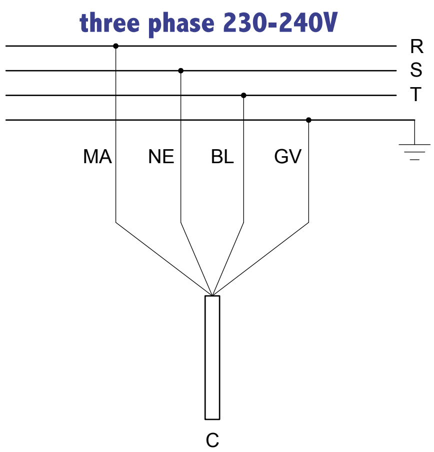
Summary

1. Electrical diagram ELECTRICAL MAINS CONNECTION

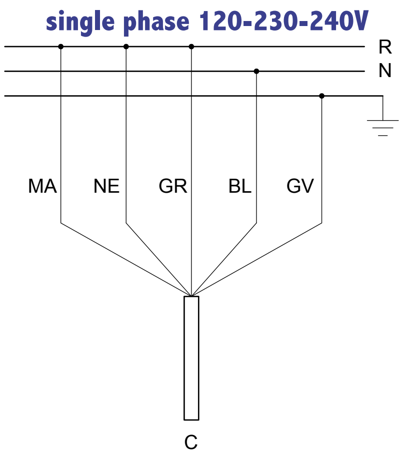


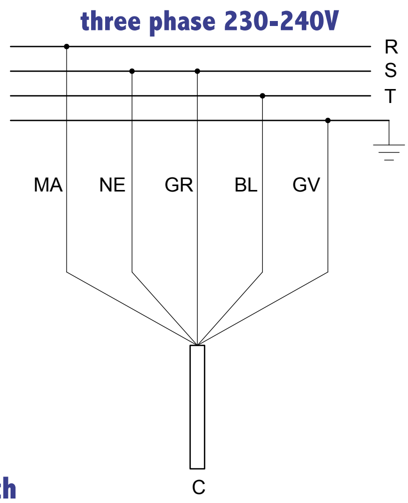
3-conductor cable

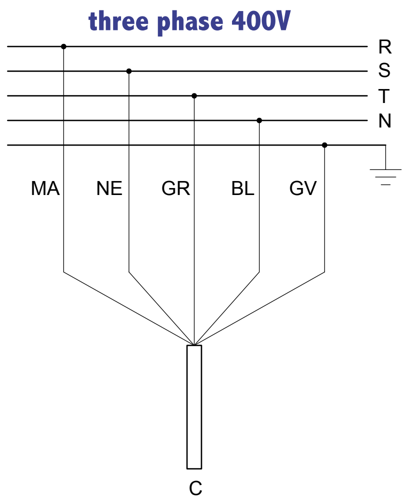




4-conductor cable





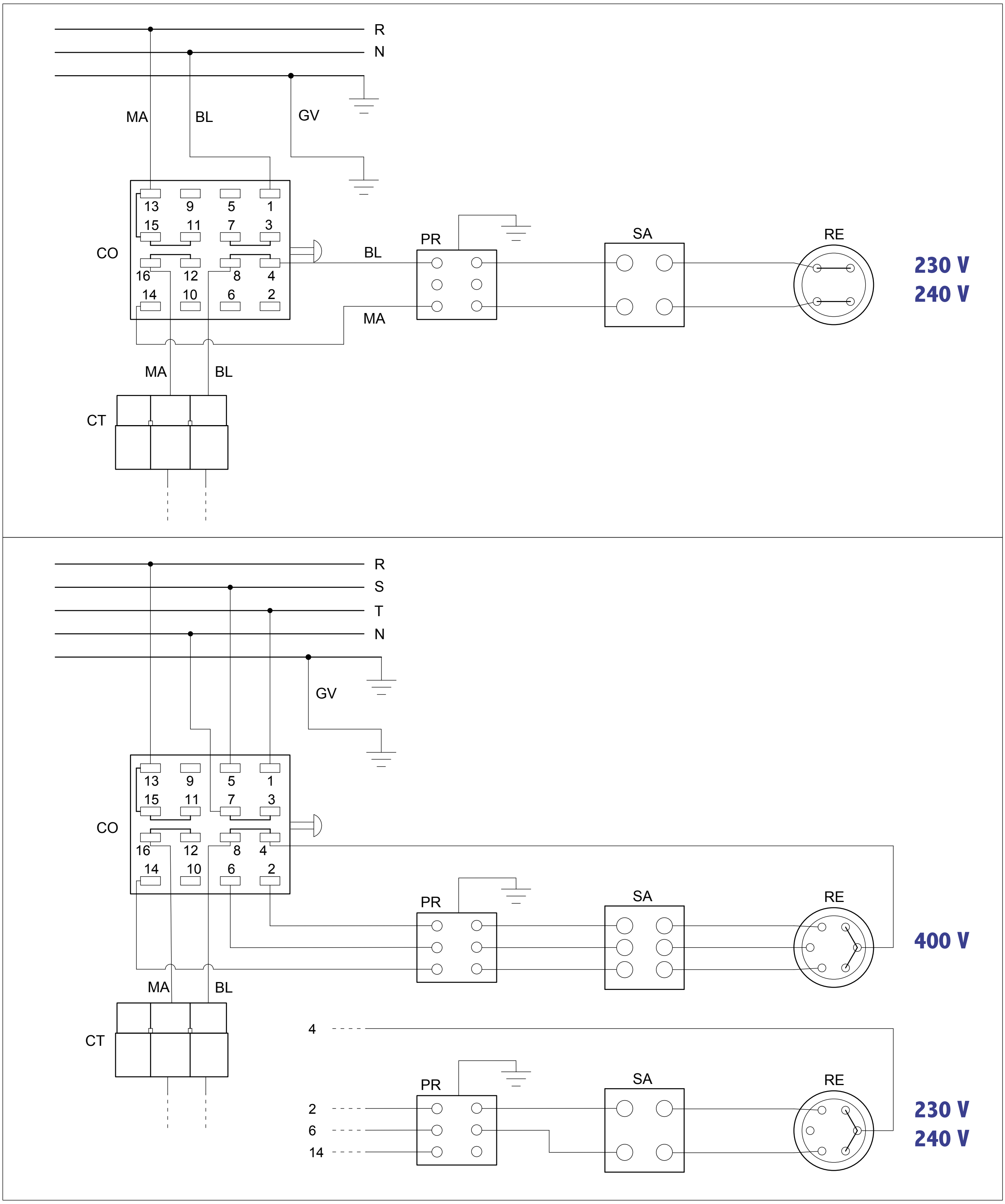


3-conductor cable + Neutral + Earth

R	Phase
S	Phase
T	Phase
N	Neutral

BL	Blue
C	Machine cable
GV	Yellow-green
GR	Grey
MA	Brown
NE	Black

2. Electrical diagram MACHINE POWER SUPPLY

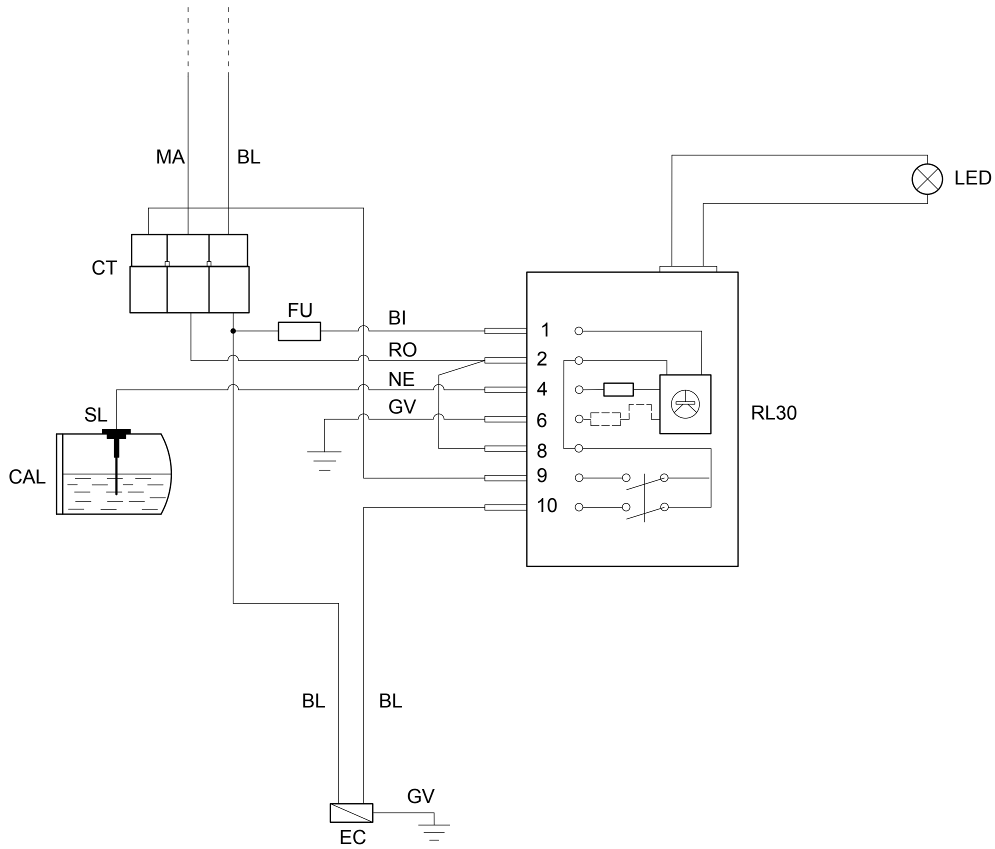


CT	Power supply connector
CO	Commutator
PR	Pressure switch
SA	Heating element protection
RE	heating element

R	Phase
S	Phase
T	Phase
N	Neutral

BL	Blue
GV	Yellow-green
MA	Brown

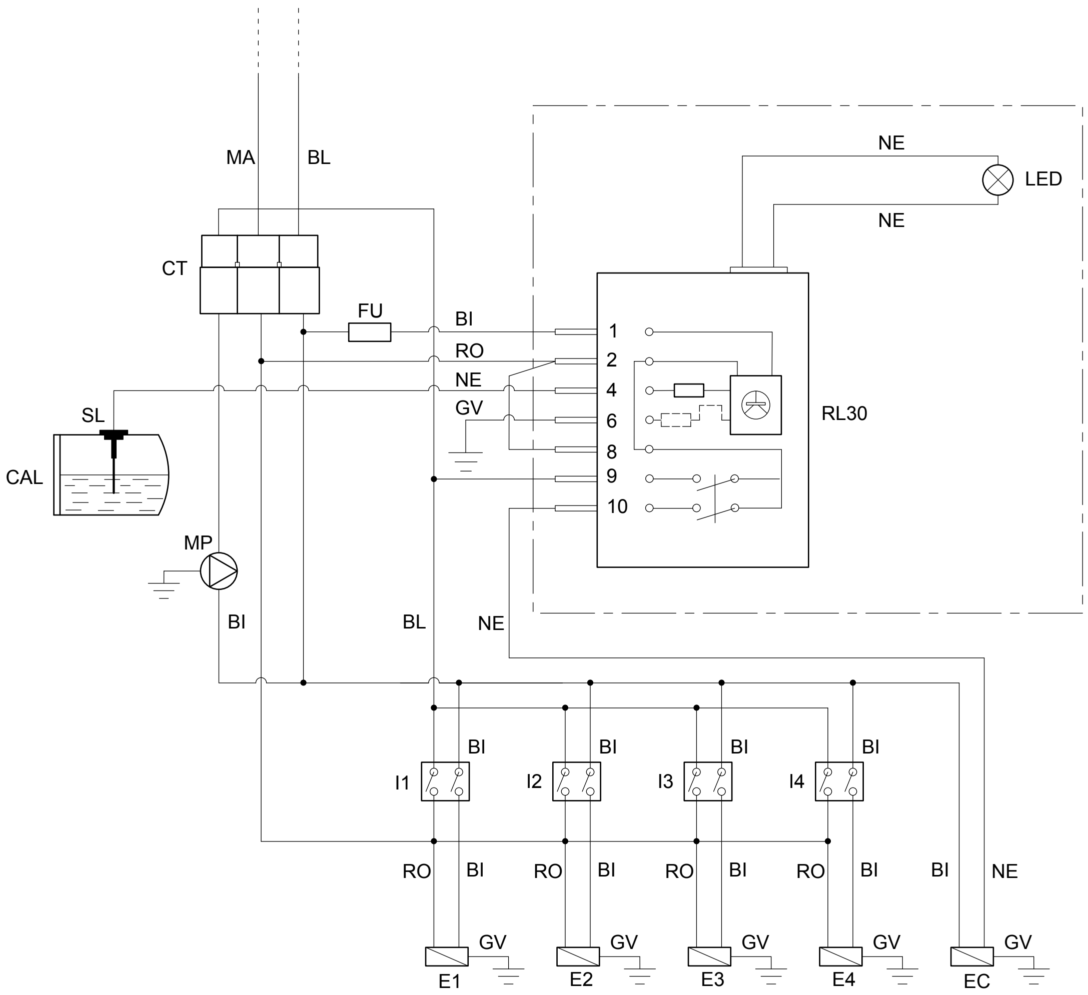
3. Electrical diagram version AL-SMMA with automatic water inlet



CAL	Boiler
CT	Power supply connector
EC	Boiler filling solenoid valve
FU	Fuse
LED	Time limit LED
RL30	Electronic control unit
SL	Level probe

BI	White
BL	Blue
GV	Yellow-green
MA	Brown
NE	Black
RO	Red

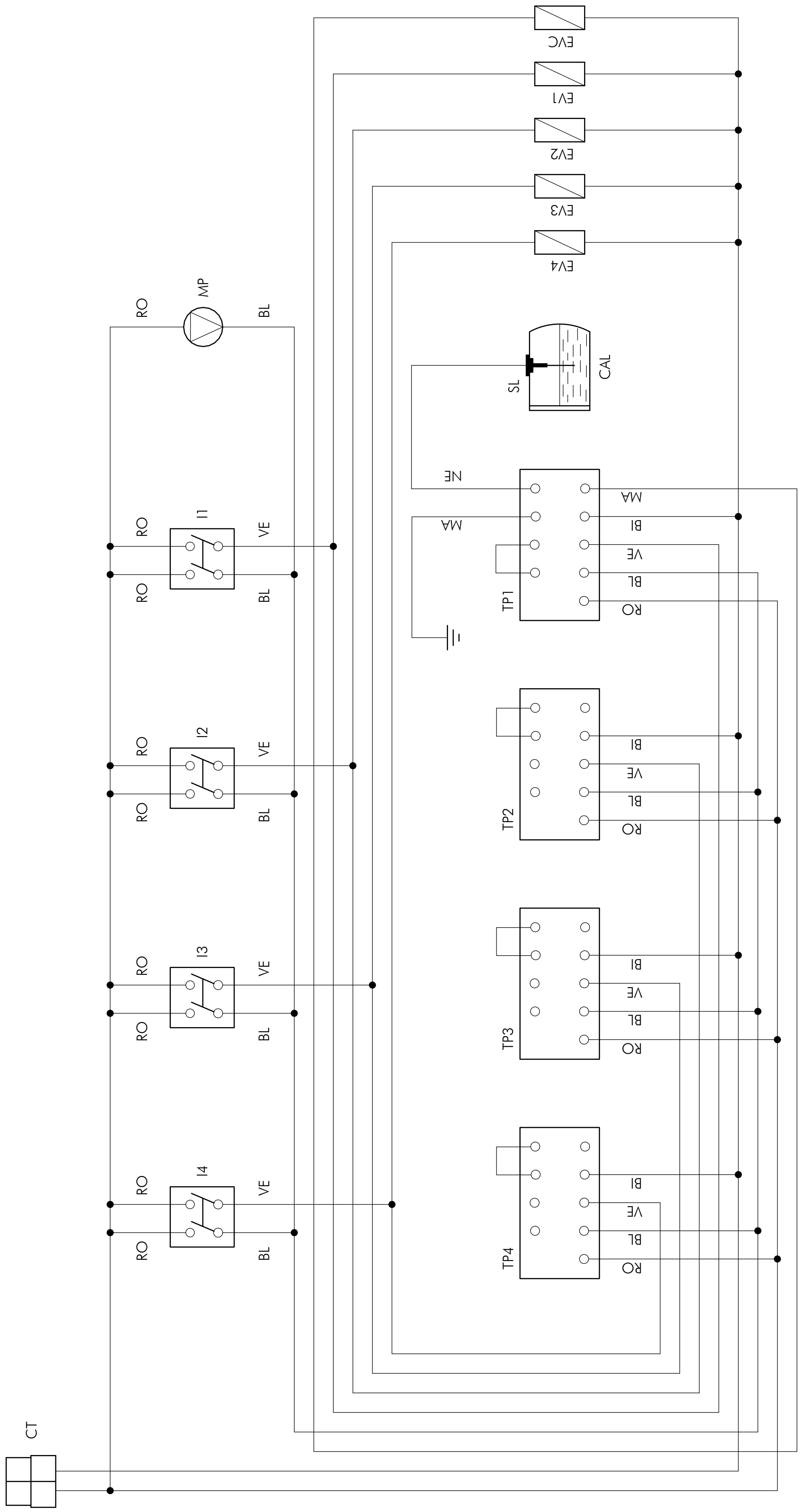
4. Electrical diagram version AEP-SMSA



CAL	Boiler
CT	Power supply connector
EC	Boiler filling solenoid valve
E...	Group solenoid valve
FU	Fuse
I...	Delivery switch...
MP	Motor pump
RL30	Electronic control unit RL30
SL	Level probe

BI	White
BL	Blue
GV	Yellow-green
MA	Brown
NE	Black
RO	Red

5. Electrical diagram version AEAP-SMAT



CAL	Boiler
CT	Power supply connector
EVC	Boiler filling solenoid valve
EV1	Solenoid valve GR1
EV2	Solenoid valve GR2
EV3	Solenoid valve GR3
EV4	Solenoid valve GR4
I1	Delivery switch GR1
I2	Delivery switch GR2
I3	Delivery switch GR3
I4	Delivery switch GR4

MP	Pump
SL	Level probe
TP1	Timer GR1
TP2	Timer GR2
TP3	Timer GR3
TP4	Timer GR4

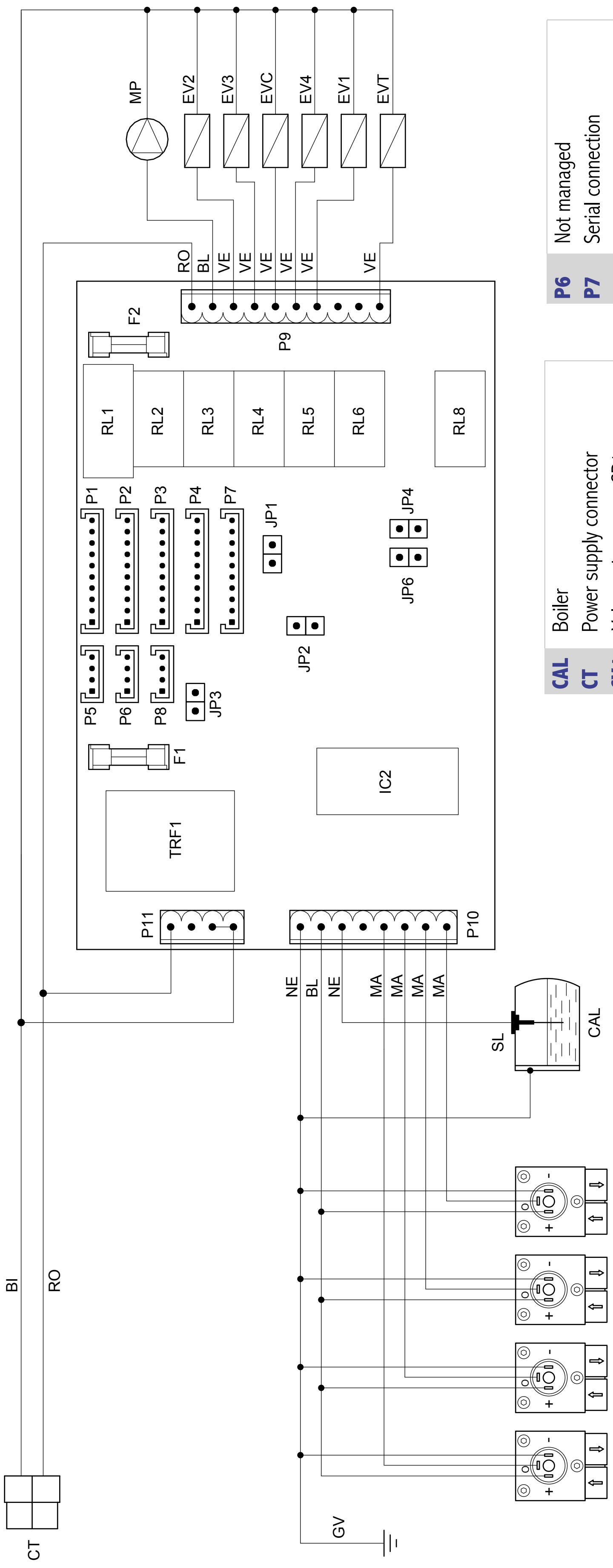
BI	White
BL	Blue
MA	Brown
RO	Red
VE	Green

6. Electrical diagrams version SAE-SME

The table below shows, for each model of machine, the code for the control unit and the reference for the electrical diagram which can be consulted on the following pages

MACHINE MODEL	CODE CONTROL UNIT	diagram GIEMME	diagram GICAR
Adria 1-2-3 GR - 120V	18090030	6.07	6.08
Adria 1-2-3 GR - 230V	18090031	6.07	6.08
Argenta 1-2-3 GR - 120V	18078	6.01	6.02
Argenta 1-2-3 GR - 230V	18079	6.01	6.02
Argenta 4 GR - 240V	18077	6.01	6.02
Argenta JUN - 120V	18366	6.04	
Argenta JUN - 230V	18365	6.04	
Brava 1-2-3 GR - 120V	18090017	6.05	6.06
Brava 1-2-3 GR - 230V	18090016	6.05	6.06
Brava 4 GR - 230V	18090028	6.05	6.06
Compatta 120V	18078	6.01	6.02
Compatta 230V	18079	6.01	6.02
Denise 1-2-3 GR - 120V	18078	6.01	6.02
Denise 1-2-3 GR - 230V	18079	6.01	6.02
Divina 1-2-3 GR - 120V	18090017	6.05	6.06
Divina 1-2-3 GR - 230V	18090016	6.05	6.06
Divina JUN - 120V	18371011	6.09	
Divina JUN - 230V	18371010	6.09	
Dora 1-2-3 GR - 120V	18090030	6.07	6.08
Dora 1-2-3 GR - 230V	18090031	6.07	6.08
Gloria - 120V PLUS 1 rev.0	18090047	6.11 rev.0	
Gloria - 230V PLUS 1 rev.0	18090048	6.11 rev.0	
Gloria - 120V PLUS 1 rev.1	18090047	6.13 rev.1	
Gloria - 230V PLUS 1 rev.1	18090048	6.13 rev.1	
Gloria display - 120V PLUS 2 rev.0	18090037	6.13 rev.0	
Gloria display - 230V PLUS 2 rev.0	18090038	6.13 rev.0	
Gloria display - 120V PLUS 2 rev.1	18090037	6.13 rev.1	
Gloria display - 230V PLUS 2 rev.1	18090038	6.13 rev.1	
Gloria display - 120V PLUS 3	18090051	6.14	
Gloria display - 230V PLUS 3	18090052	6.14	
Lisa 1-2-3 GR - 120V	18078	6.01	6.02
Lisa 1-2-3 GR - 230V	18079	6.01	6.02
Lisa 4 GR - 240V	18077	6.01	6.02
Lisa JUN - 120V	18366	6.04	
Lisa JUN - 230V	18365	6.04	
Pratic 1-2-3 GR - 120V	18090030	6.07	6.08
Pratic 1-2-3 GR - 230V	18090031	6.07	6.08
Sibilla - 120V PLUS 1 rev.0	18090047	6.11 rev.0	
Sibilla - 230V PLUS 1 rev.0	18090048	6.11 rev.0	
Sibilla - 120V PLUS 1 rev.1	18090047	6.13 rev.1	
Sibilla - 230V PLUS 1 rev.1	18090048	6.13 rev.1	
Sibilla display - 120V PLUS 2 rev.0	18090037	6.13 rev.0	
Sibilla display - 230V PLUS 2 rev.0	18090038	6.13 rev.0	
Sibilla display - 120V PLUS 2 rev.1	18090037	6.13 rev.1	
Sibilla display - 230V PLUS 2 rev.1	18090038	6.13 rev.1	
Sibilla display - 120V PLUS 3	18090051	6.14	
Sibilla display - 230V PLUS 3	18090052	6.14	
Vania 1-2-3 GR - 120V	18090017	6.05	6.06
Vania 1-2-3 GR - 230V	18090016	6.05	6.06
Vania base 1-2-3 GR - 120V	18090030	6.07	6.08
Vania base 1-2-3 GR - 230V	18090031	6.07	6.08
Vania JUN - 120V	18371011	6.09	
Vania JUN - 230V	18371010	6.09	

6.01 Electrical diagram code 18077-18078-18079 *GIEMME*



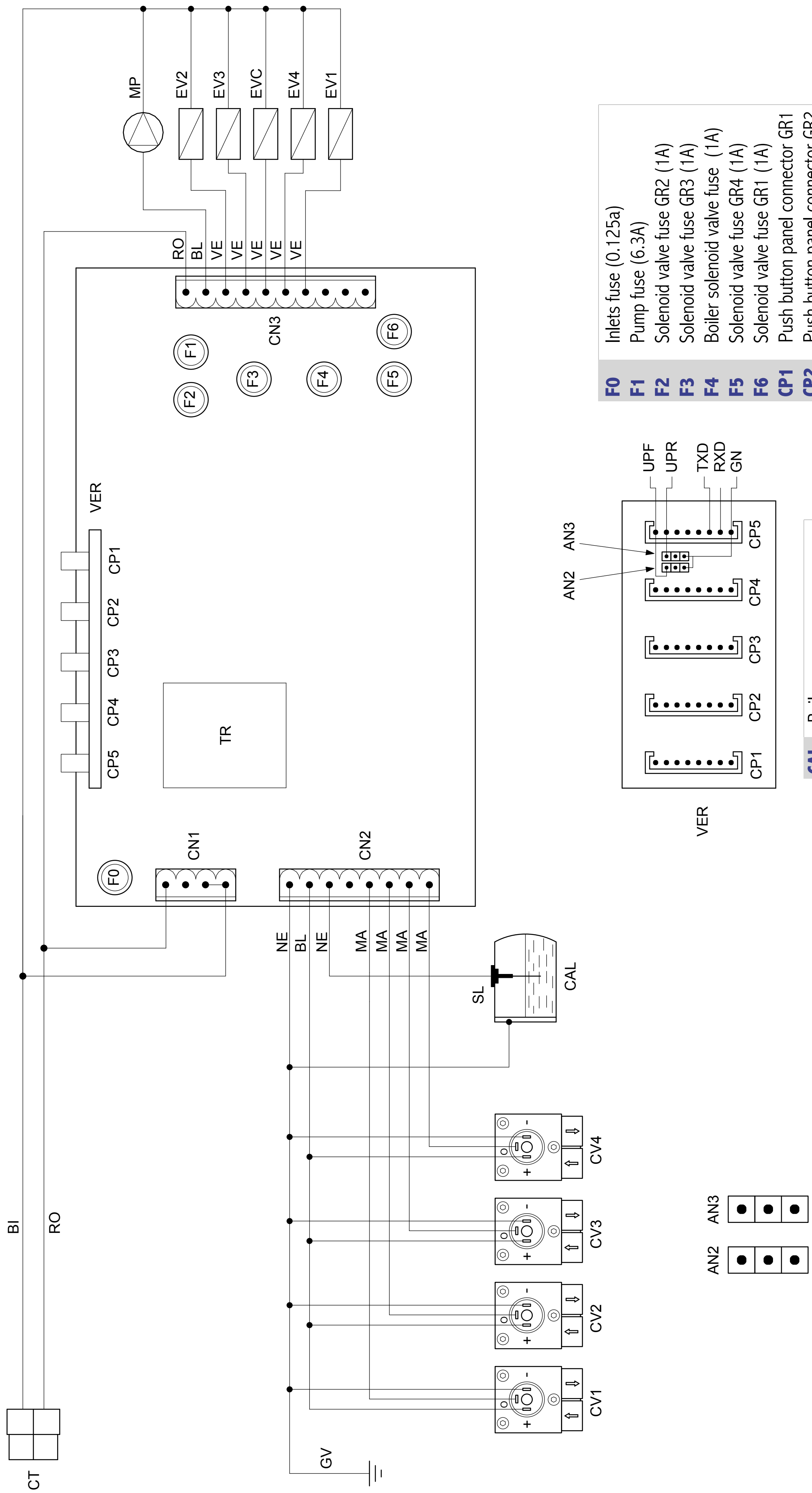
CAL	Boiler
CT	Power supply connector
CV1	Volumetric counter GR1
CV2	Volumetric counter GR2
CV3	Volumetric counter GR3
CV4	Volumetric counter GR4
EV1	Solenoid valve GR1
EV2	Solenoid valve GR2
EV3	Solenoid valve GR3
EV4	Solenoid valve GR4
EVC	Boiler filling solenoid valve
EVT	Tea solenoid valve
F1	Inlets fuse (500mA)
F2	Motor pump fuse (6,3A)
IC2	Eprom
MP	Pump
P1	Push button panel connector GR1
P2	Push button panel connector GR2
P3	Push button panel connector GR3
P4	Push button panel connector GR4
P5	Tea dose

P6	Not managed
P7	Serial connection
P9	Service outputs connector
P10	Low voltage power supply
P11	Power supply
RL1	Pump relay
RL2	Solenoid valve relay GR2
RL3	Solenoid valve relay GR3
RL4	Boiler solenoid valve relay
RL5	Solenoid valve relay GR4
RL6	Solenoid valve relay GR1
RL8	Tea solenoid valve relay
SL	Boiler level probe
TRF1	Transformer
BI	White
BL	Blue
GV	Yellow-green
MA	Brown
NE	Black
RO	Red
VE	Green

BI	White
BL	Blue
GV	Yellow-green
MA	Brown
NE	Black
RO	Red
VE	Green

	JUMPER INSERTED	JUMPER NOT INSERTED
JP1	Serial connection enabled	Serial connection disabled
JP2	Pre-infusion enabled	Pre-infusion disabled
JP3	Dose programming enabled	Dose programming disabled
JP4	Boiler filling with pump	Boiler filling without pump
JP6	Tea delivery with pump	Tea delivery without pump

6.02 Electrical diagram code 18077-18078-18079 *GICAR*



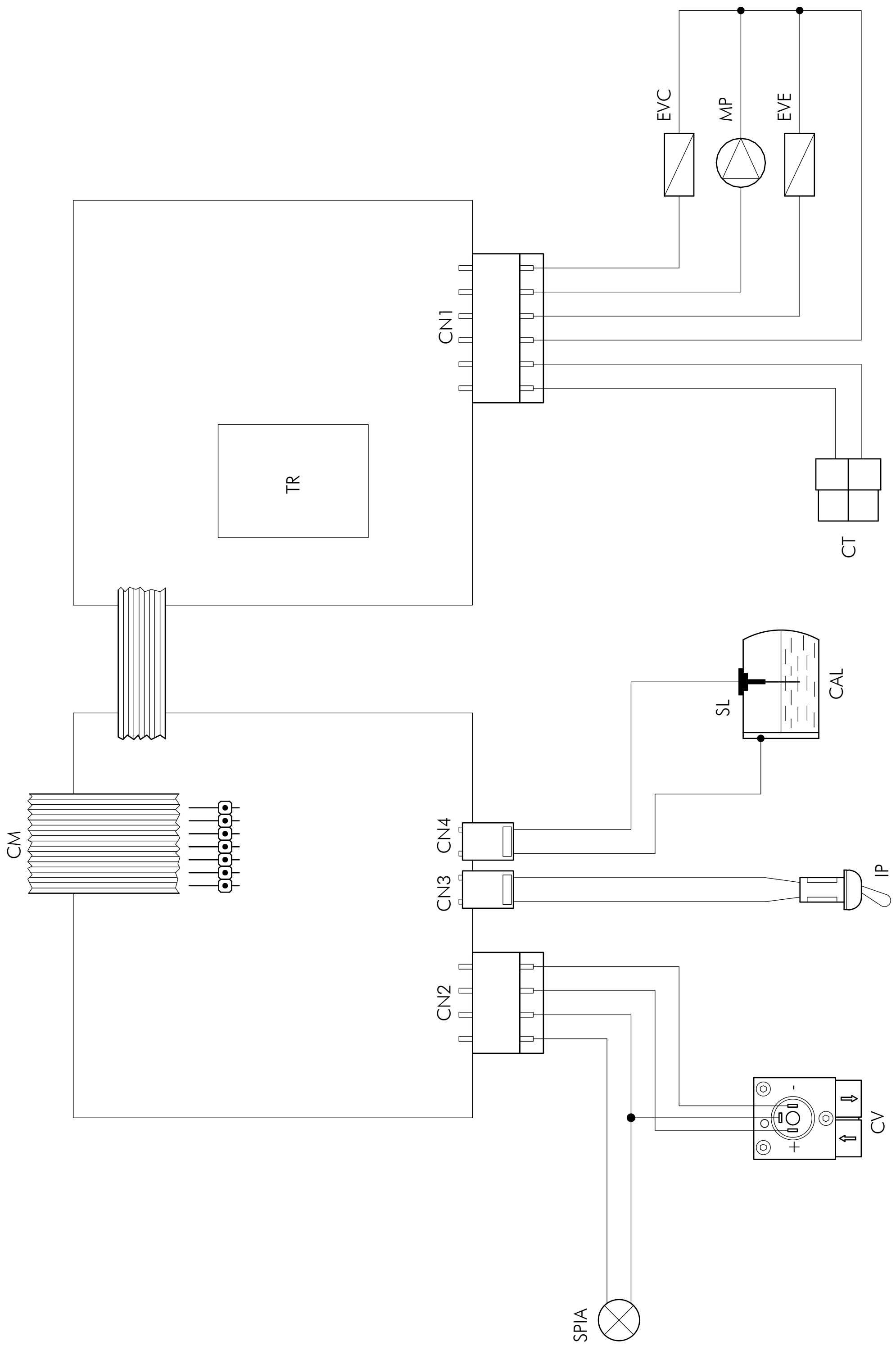
F0	Inlets fuse (0.125a)
F1	Pump fuse (6.3A)
F2	Solenoid valve fuse GR2 (1A)
F3	Solenoid valve fuse GR3 (1A)
F4	Boiler solenoid valve fuse (1A)
F5	Solenoid valve fuse GR4 (1A)
F6	Solenoid valve fuse GR1 (1A)
CP1	Push button panel connector GR1
CP2	Push button panel connector GR2
CP3	Push button panel connector GR3
CP4	Push button panel connector GR4
CP5	Serial connector
CN1	Service outputs connector
CN2	Low voltage power supply
CN3	Power supply connector
SL	Level probe
TR	Transformer
UPF	Pre-infusion output
UPR	Programming output
VER	Vertical printed circuit

CAL	Boiler
CT	Power supply connector
CV1	Volumetric counter GR1
CV2	Volumetric counter GR2
CV3	Volumetric counter GR3
CV4	Volumetric counter GR4
D	Selection counter
EV1	Solenoid valve GR1
EV2	Solenoid valve GR1
EV3	Solenoid valve GR1
EV4	Solenoid valve GR1
EVC	Filling solenoid valve Boiler

BI	White
BL	Blue
GV	Yellow-green
MA	Brown
NE	Black
RO	Red
VE	Green

	JUMPER	ACTIVATION
AN2	Jumper between 1 and 2	Pre-infusion OFF
	Jumper between 2 and 3	Pre-infusion ON
AN3	Jumper between 1 and 2	Programming OFF
	Jumper between 2 and 3	Programming ON

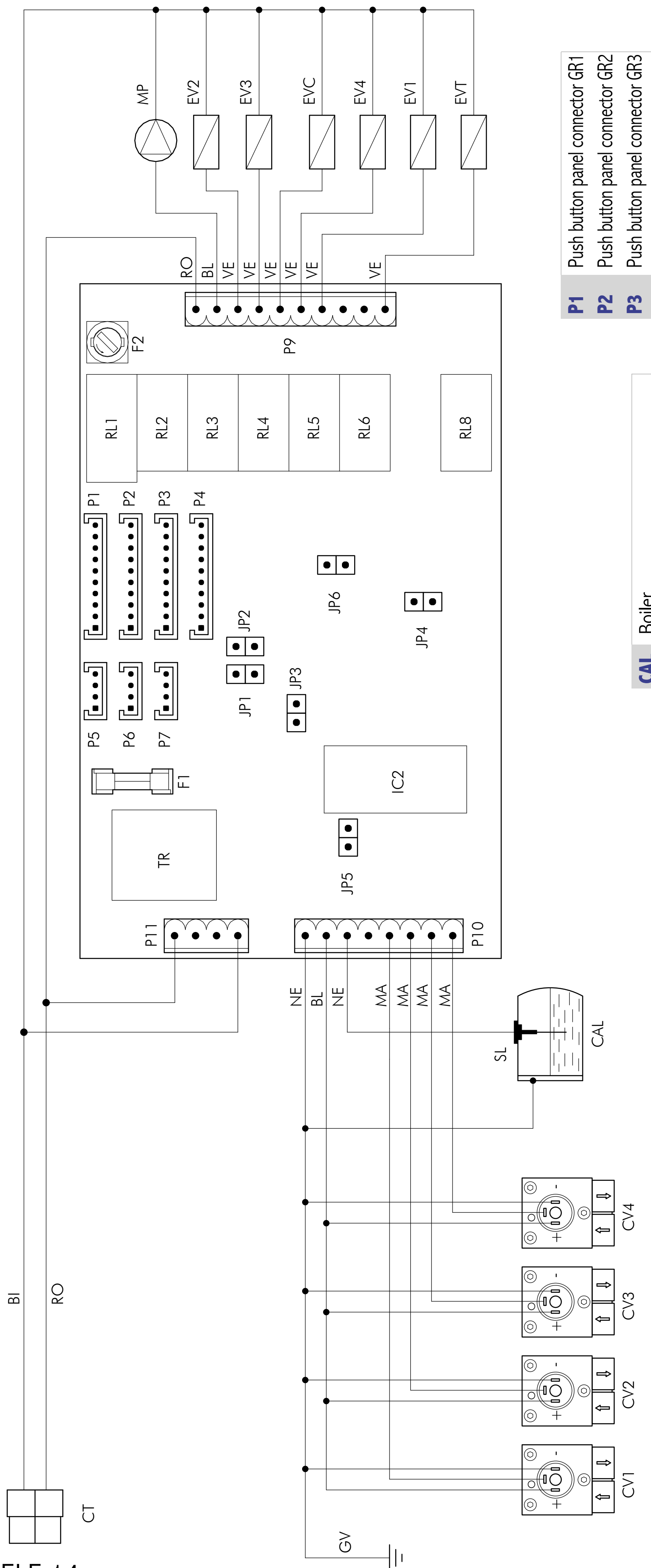
6.04 Electrical diagram code 18365-18366 *JUNIOR*



EVC	Filling solenoid valve
EVE	Delivery solenoid valve
IP	Programming switch
MP	Pump
SL	Level probe
SPIA	On indicator light
TR	Transformer

CAL	Boiler
CM	Membrane connection
CN1	Power supply and services outputs
CN2	Dosing device output
CN3	Programming switch
CN4	Boiler level
CT	Power supply connector
CV	Volumetric counter

6.05 Electrical diagram code 18090016-18090017-18090028 *GIEMME*



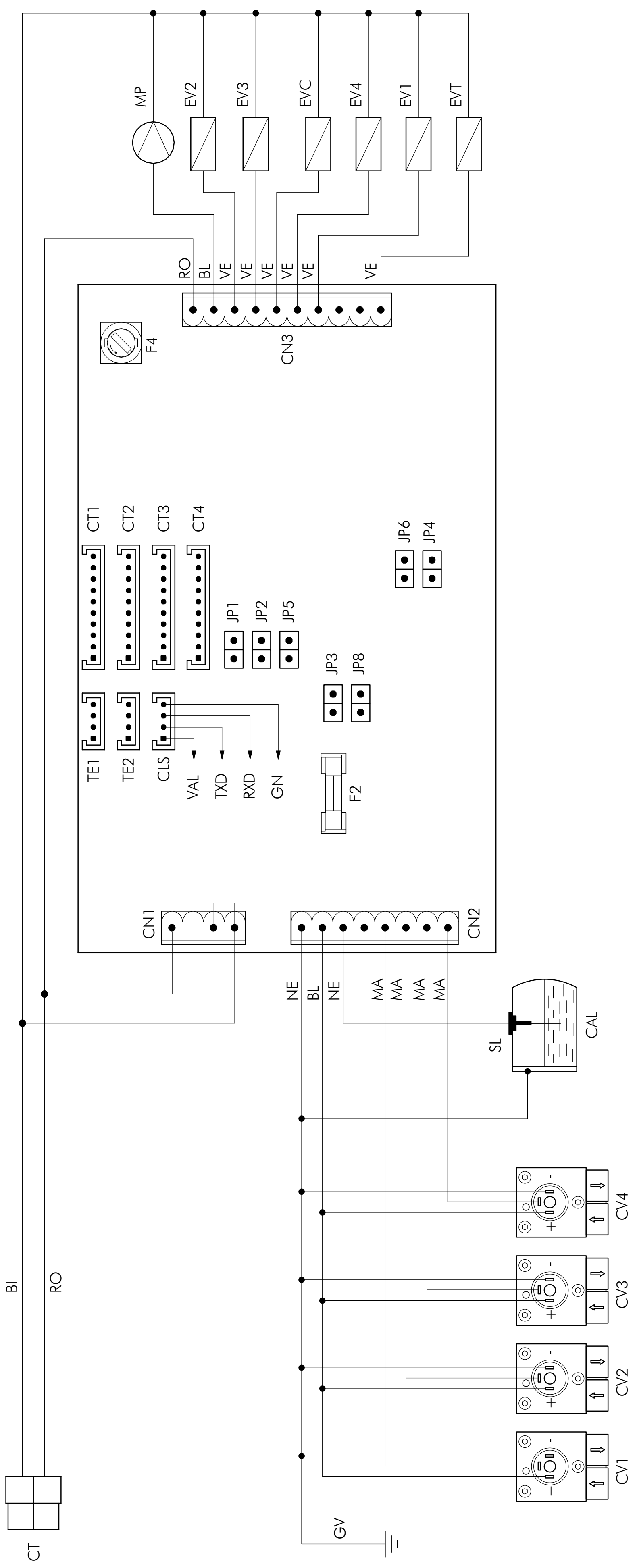
P1	Push button panel connector GR1
P2	Push button panel connector GR2
P3	Push button panel connector GR3
P4	Push button panel connector GR4
P5	Tea dose
P6	Not managed
P7	Serial connection
P9	Service outputs connector
P10	Low voltage power supply
P11	Power supply
RL1	Pump relay
RL2	Solenoid valve relay GR2
RL3	Solenoid valve relay GR3
RL4	Boiler solenoid valve relay
RL5	Solenoid valve relay GR4
RL6	Solenoid valve relay GR1
RL8	Tea solenoid valve relay
SL	Boiler level probe
TRF	Transformer

CAL	Boiler
CT	Power supply connector
CV1	Volumetric counter GR1
CV2	Volumetric counter GR2
CV3	Volumetric counter GR3
CV4	Volumetric counter GR4
EV1	Solenoid valve GR1
EV2	Solenoid valve GR2
EV3	Solenoid valve GR3
EV4	Solenoid valve GR4
EVC	Boiler filling solenoid valve
EVT	Tea solenoid valve
F1	Inlets fuse (500mA)
F2	Motor pump fuse (6,3A)
IC2	Eprom
MP	Pump

BI	White
BL	Blue
GV	Yellow-green
MA	Brown
NE	Black
RO	Red
VE	Green

	JUMPER INSERTED	JUMPER NOT INSERTED
JP1	Serial connection enabled	Serial connection disabled
JP2	Pre-infusion enabled	Pre-infusion disabled
JP3	Dose programming enabled	Dose programming disabled
JP4	Tea delivery with pump	Tea delivery without pump
JP5	Tea key enabled	Tea key disabled

6.06 Electrical diagram code 18090016-18090017-18090028 *GICAR*



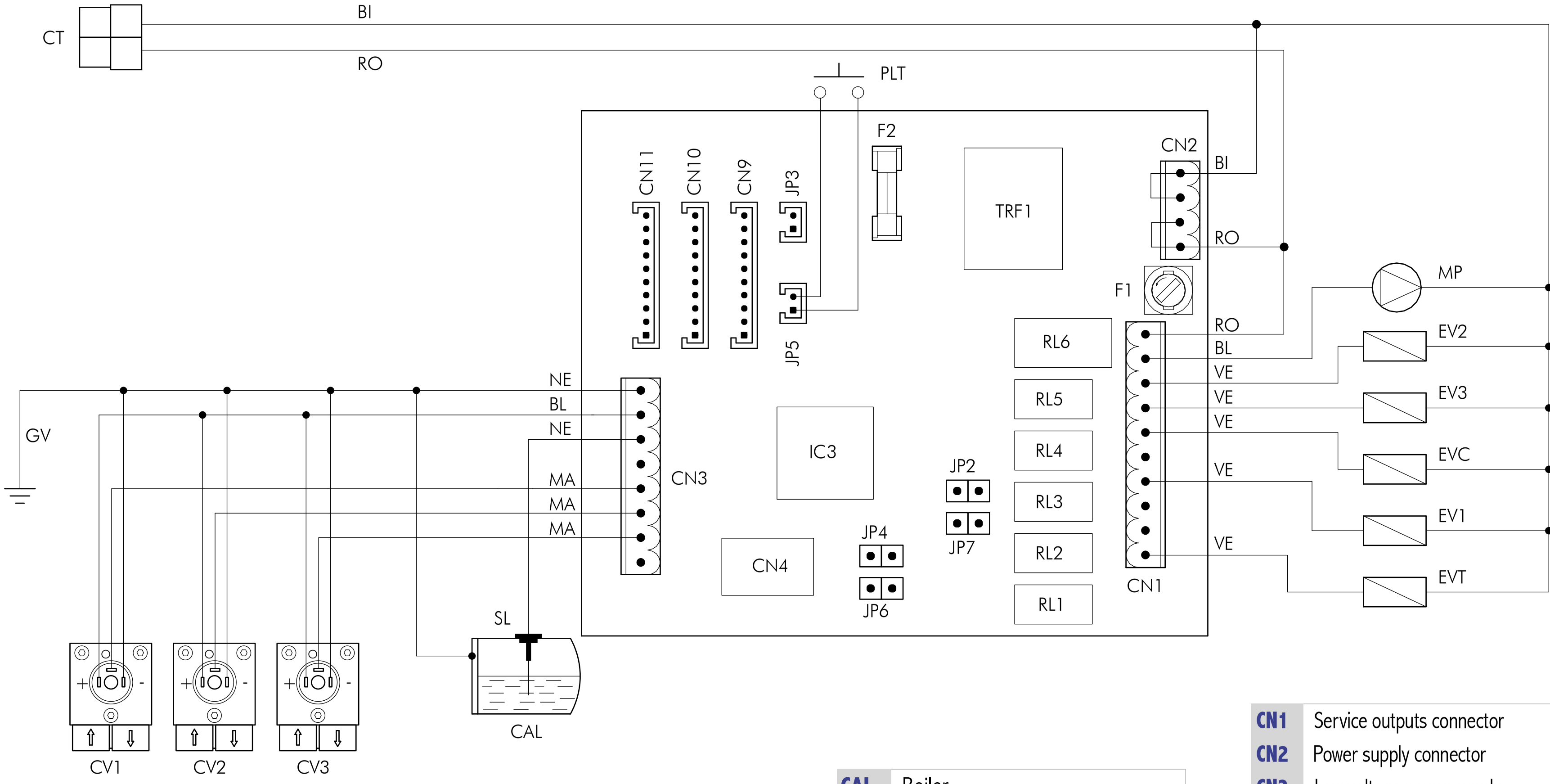
MP	Pump
CT1	Push button panel connector GR1
CT2	Push button panel connector GR2
CT3	Push button panel connector GR3
CT4	Push button panel connector GR4
TE1	Tea dose
TE2	Not managed
CLS	Serial connection
CN1	Power supply
CN2	Low voltage power supply
CN3	Service outputs connector
SL	Boiler level probe

CAL	Boiler
CT	Power supply connector
CV1	Volumetric counter GR1
CV2	Volumetric counter GR2
CV3	Volumetric counter GR3
EV1	Solenoid valve GR1
EV2	Solenoid valve GR2
EV3	Solenoid valve GR3
EVC	Boiler filling solenoid valve
EVT	Tea solenoid valve
F2	Inlets fuse (500mA)
F4	Motor pump fuse (6.3A)

BI	White
BL	Blue
GV	Yellow-green
MA	Brown
NE	Black
RO	Red
VE	Green

	JUMPER INSERTED	JUMPER NOT INSERTED
JP1	Serial connection enabled	Serial connection disabled
JP2	Pre-infusion enabled	Pre-infusion disabled
JP3	Dose programming enabled	Dose programming disabled
JP4	Boiler filling with pump	Boiler filling without pump
JP5	Configuration "W"	Configuration "C"
JP6	Tea delivery with pump	Tea delivery without pump
JP8	Control D	I/O Interface

6.07 Electrical diagram code 18090030-18090031 *GIEMME*



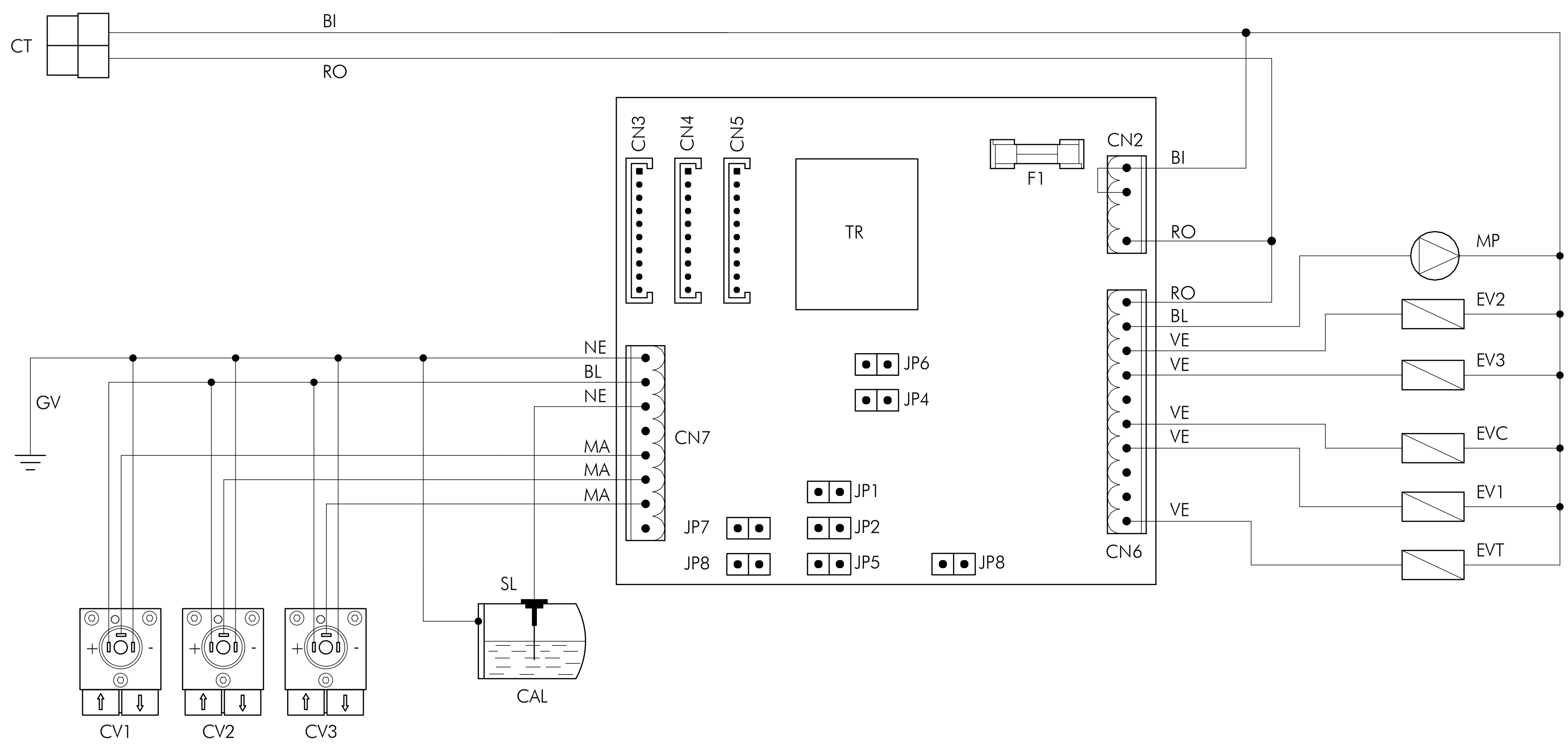
	JUMPER INSERTED	JUMPER NOT INSERTED
JP2	Pre-infusion enabled	Pre-infusion disabled
JP3	Dose programming enabled	Dose programming disabled
JP4	Boiler filling with pump	Boiler filling without pump
JP5	Tea key enabled	Tea key disabled
JP6	Tea delivery with pump	Tea delivery without pump
JP7	STOP key continuation enabled	STOP key continuation enabled

BI	White
BL	Blue
GV	Yellow-green
MA	Brown
NE	Black
RO	Red
VE	Green

CAL	Boiler
CT	Power supply connector
CV1	Volumetric counter GR1
CV2	Volumetric counter GR2
CV3	Volumetric counter GR3
EV1	Solenoid valve GR1
EV2	Solenoid valve GR2
EV3	Solenoid valve GR3
EVC	Boiler filling solenoid valve
EVT	Tea solenoid valve
F1	Motor pump fuse (6.3A)
F2	Inlets fuse (500mA)
IC3	Eprom
MP	Pump

CN1	Service outputs connector
CN2	Power supply connector
CN3	Low voltage power supply
CN4	Programming connector
CN9	Push button panel connector GR3
CN10	Push button panel connector GR2
CN11	Push button panel connector GR1
PLT	Tea push button
RL1	Tea solenoid valve relay
RL2	Solenoid valve relay GR1
RL3	Boiler solenoid valve relay
RL4	Solenoid valve relay GR3
RL5	Solenoid valve relay GR2
RL6	Pump relay
SL	Boiler level probe
TRF1	Transformer

6.08 Electrical diagram code 18090030-18090031 *GICAR*



	JUMPER INSERTED	JUMPER NOT INSERTED
JP1	Not managed	Not managed
JP2	Pre-infusion enabled	Pre-infusion disabled
JP3	Dose programming enabled	Dose programming disabled
JP4	Boiler filling with pump	Boiler filling without pump
JP5	Tea key enabled	Tea key disabled
JP6	Tea delivery with pump	Tea delivery without pump
JP7	Not managed	Not managed
JP8	Not managed	Not managed

BI	White
BL	Blue
GV	Yellow-green
MA	Brown
NE	Black
RO	Red
VE	Green

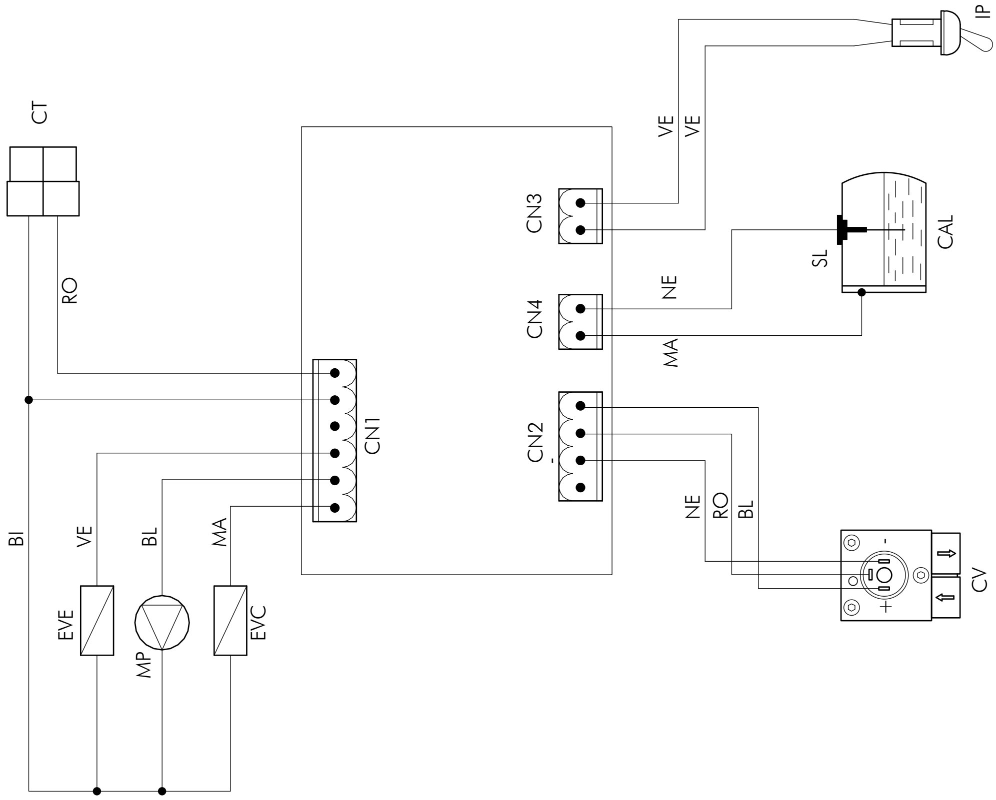
CAL	Boiler
CT	Power supply connector
CV1	Volumetric counter GR1
CV2	Volumetric counter GR2
CV3	Volumetric counter GR3
EV1	Solenoid valve GR1
EV2	Solenoid valve GR2
EV3	Solenoid valve GR3
EVC	Boiler filling solenoid valve
EVT	Tea solenoid valve

F1	Inlets fuse (500mA)
MP	Pump
CN2	Power supply
CN3	Push button panel connector GR1
CN4	Push button panel connector GR2
CN5	Push button panel connector GR3
CN6	Service outputs connector
CN7	Low voltage power supply
SL	Boiler level probe
TR	Transformer

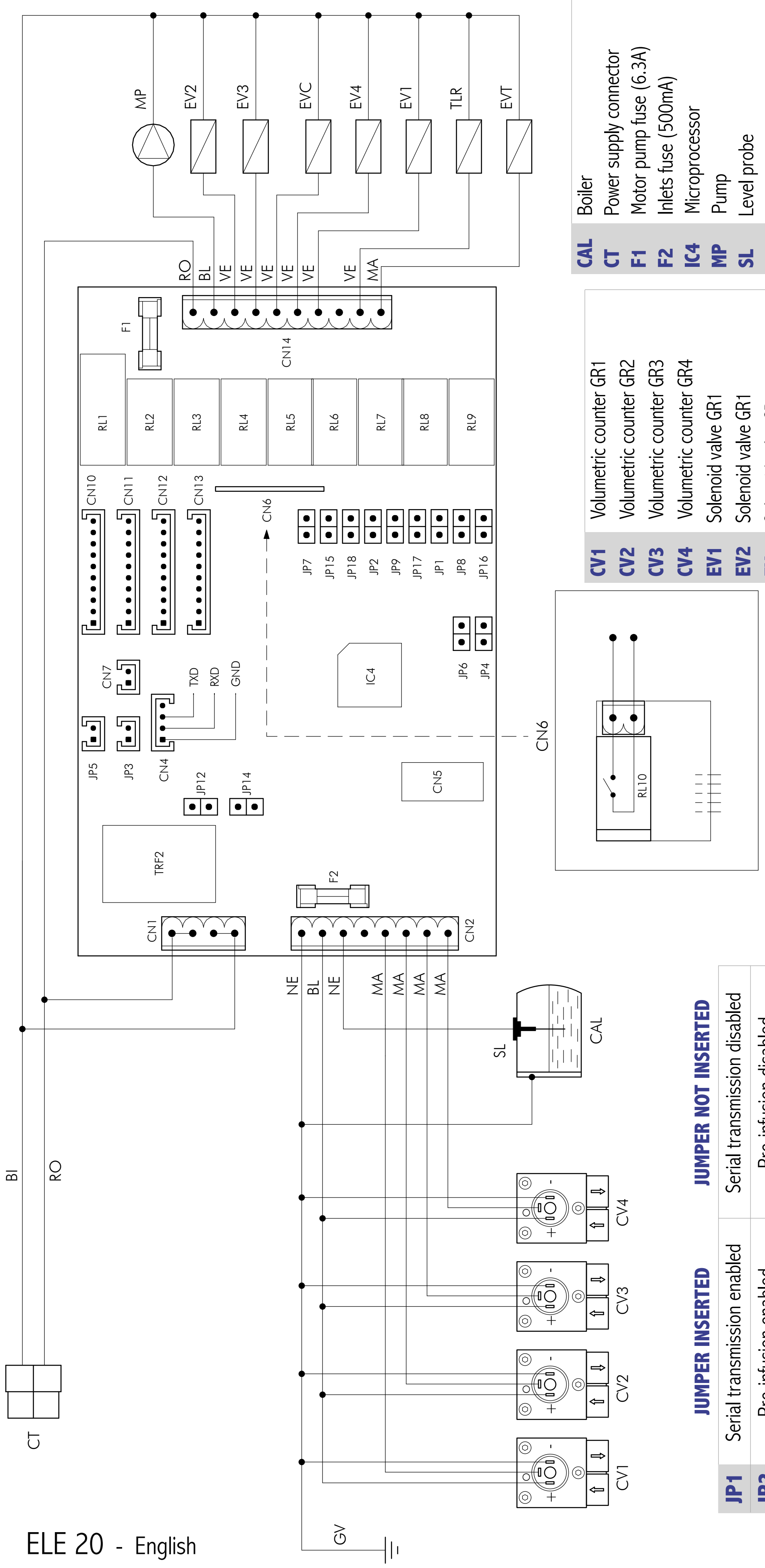
6.09 Electrical diagram code 18371010-18371011 *JUNIOR*

CAL	Boiler
CN1	Power supply and services outputs
CN2	Dosing device connector
CN3	Programming switch connector
CN4	Boiler level connector
CT	Power supply connector
CV	Volumetric counter
ELC	Water filling solenoid valve
ELE	Delivery solenoid valve
IP	Programming switch
MP	Pump
SL	Boiler level probe

BI	White
BL	Blue
MA	Brown
NE	Black
RO	Red
VE	Green



6.11 Electrical diagram code 18090047-18090048 *GLORIA-SIBILLA* **PLUS 1 rev.0**



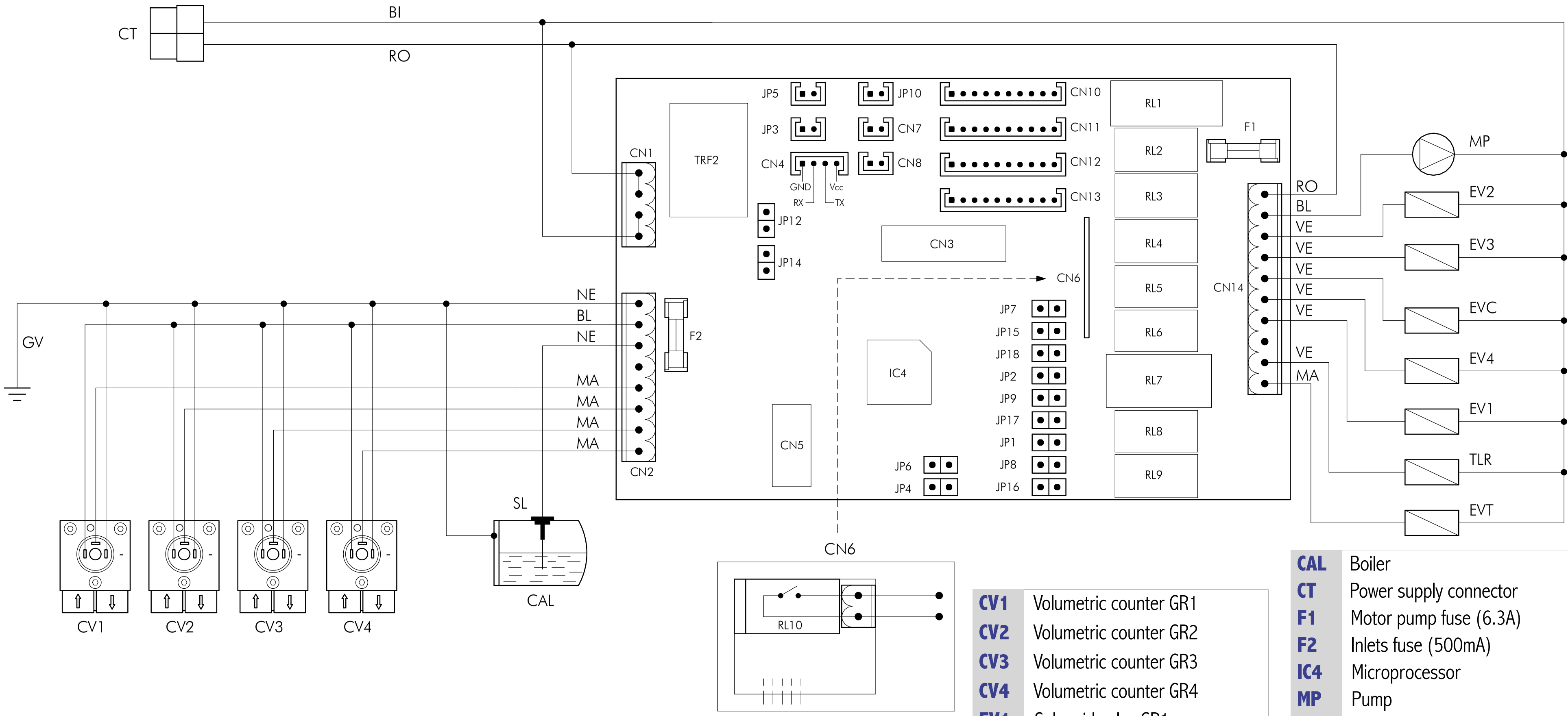
CAL	Boiler
CT	Power supply connector
F1	Motor pump fuse (6.3A)
F2	Inlets fuse (500mA)
IC4	Microprocessor
MP	Pump
SL	Level probe
TLR	Remote switch
TRF2	Transformer
CN1	Power supply connector
CN2	Low voltage power supply
CN4	Serial transmission connector
CN5	Not managed
CN6	Vertical card cup heater heating element
CN7	Cup heater temperature probe connector
CN10	Push button panel connector GR1
CN11	Push button panel connector GR2
CN12	Push button panel connector GR3
CN13	Push button panel connector GR4
CN14	Service outputs connector
JP3	Programming
JP5	Tea dose

CV1	Volumetric counter GR1
CV2	Volumetric counter GR2
CV3	Volumetric counter GR3
CV4	Volumetric counter GR4
EV1	Solenoid valve GR1
EV2	Solenoid valve GR1
EV3	Solenoid valve GR1
EV4	Solenoid valve GR1
EVC	Boiler filling solenoid valve
EVT	Tea solenoid valve
RL1	Tea solenoid valve relay
RL2	Solenoid valve relay GR2
RL3	Solenoid valve relay GR3
RL4	Boiler solenoid valve relay
RL5	Solenoid valve relay GR4
RL6	Solenoid valve relay GR1
RL7	On/off relay
RL8	Boiler heating element relay
RL9	Tea solenoid valve relay
RL10	Cup heater heating element relay

BI	White
BL	Blue
GV	Yellow-green
MA	Brown
NE	Black
RO	Red
VE	Green

	JUMPER INSERTED	JUMPER NOT INSERTED
JP1	Serial transmission enabled	Serial transmission disabled
JP2	Pre-infusion enabled	Pre-infusion disabled
JP4	Boiler filling with pump	Boiler filling without pump
JP6	Tea delivery with pump	Tea delivery without pump
JP7	STOP key continuation enabled	STOP key continuation enabled
JP8	Not managed	Not managed
JP9	Reset card software	--------
JP12	Not managed	Not managed
JP14	Not managed	Not managed
JP15	Not managed	Not managed
JP16	6-key dosing device enabled	6-key dosing device disabled
JP17	Not managed	Not managed
JP18	Not managed	Not managed

6.13 Electrical diagram code 18090037-18090038 *GLORIA-SIBILLA DISPLAY* **PLUS 2 rev.0**



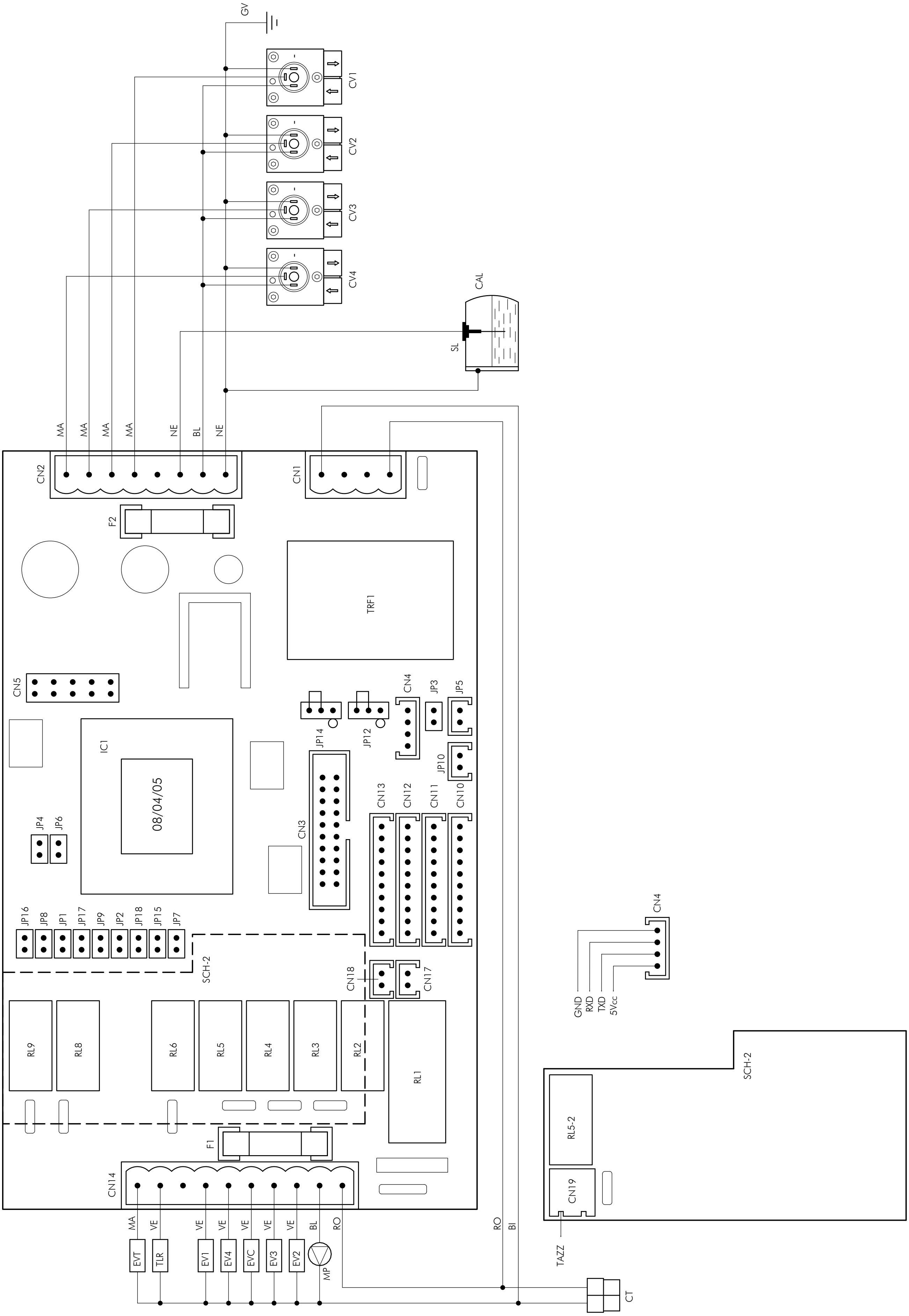
CAL	Boiler
CT	Power supply connector
F1	Motor pump fuse (6.3A)
F2	Inlets fuse (500mA)
IC4	Microprocessor
MP	Pump
SL	Level probe
TLR	Remote switch
TRF2	Transformer
CN1	Power supply connector
CN2	Low voltage power supply
CN3	Display connector
CN4	Serial transmission connector
CN5	Not managed
CN6	Vertical card cup heater heating element
CN7	Cup heater temperature probe connector
CN8	Boiler probe connector
CN10	Push button panel connector GR1
CN11	Push button panel connector GR2
CN12	Push button panel connector GR3
CN13	Push button panel connector GR4
CN14	Service outputs connector
JP3	Programming
JP5	Tea dose

CV1	Volumetric counter GR1
CV2	Volumetric counter GR2
CV3	Volumetric counter GR3
CV4	Volumetric counter GR4
EV1	Solenoid valve GR1
EV2	Solenoid valve GR1
EV3	Solenoid valve GR1
EV4	Solenoid valve GR1
EVC	Filling solenoid valve Boiler
EVT	Tea solenoid valve
RL1	Tea solenoid valve relay
RL2	Solenoid valve relay GR2
RL3	Solenoid valve relay GR3
RL4	Boiler solenoid valve relay
RL5	Solenoid valve relay GR4
RL6	Solenoid valve relay GR1
RL7	On/off relay
RL8	Boiler heating element relay
RL9	Tea solenoid valve relay
RL10	Cup heater heating element relay

BI	White
BL	Blue
GV	Yellow-green
MA	Brown
NE	Black
RO	Red
VE	Green

	JUMPER INSERTED	JUMPER NOT INSERTED
JP1	Serial transmission enabled	Serial transmission disabled
JP2	Pre-infusion enabled	Pre-infusion disabled
JP4	Boiler filling with pump	Boiler filling without pump
JP6	Tea delivery with pump	Tea delivery without pump
JP7	STOP key continuation enabled	STOP key continuation enabled
JP8	Not managed	Not managed
JP9	Reset card software	-------
JP12	Not managed	Not managed
JP14	Not managed	Not managed
JP15	Keypad function keys enabled	Display function keys enabled
JP16	6-key dosing device enabled	4-key dosing device enabled
JP17	Not managed	Not managed
JP18	Not managed	Not managed

6.13.1 Electrical diagram code 18090037-38-47-48 *GLORIA-SIBILLA* **PLUS 1-2 rev.1**



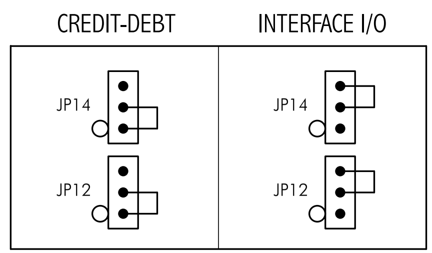
CN1	Power supply connector
CN2	Low voltage power supply
CN3	Display connector
CN4	Serial transmission connector
CN5	Microprocessor connector
CN10	Push button panel connector GR1
CN11	Push button panel connector GR2
CN12	Push button panel connector GR3
CN13	Push button panel connector GR4
CN14	Service outputs connector
CN17	Connector boiler NTC
CN18	Connector Cup heater NTC
CN19	Connector Cup heater heating el.
CT	Power supply connector
CAL	Boiler
IC1	Microprocessor
MP	Pump
TLR	Remote switch
TRF1	Transformer
TAZZ	Cup heater
BI	White
BL	Blue
GV	Yellow-green
MA	Brown
NE	Black
RO	Red
VE	Green

CV1	Volumetric counter GR1
CV2	Volumetric counter GR2
CV3	Volumetric counter GR3
CV4	Volumetric counter GR4
EV1	Solenoid valve GR1
EV2	Solenoid valve GR2
EV3	Solenoid valve GR3
EV4	Solenoid valve GR4
EVC	Filling solenoid valve Boiler
EVT	Tea solenoid valve
F1	Ouputs fuse (6,3A)
F2	Inputs fuse (500mA)
RL1	Solenoid valve relay Pump
RL2	Solenoid valve relay GR2
RL3	Solenoid valve relay GR3
RL4	Solenoid valve relay Boiler
RL5	Solenoid valve relay GR4
RL6	Solenoid valve relay GR1
RL8	Boiler heating element relay
RL9	Solenoid valve relay Tea
RL5-2	Solenoid valve relay cup heater

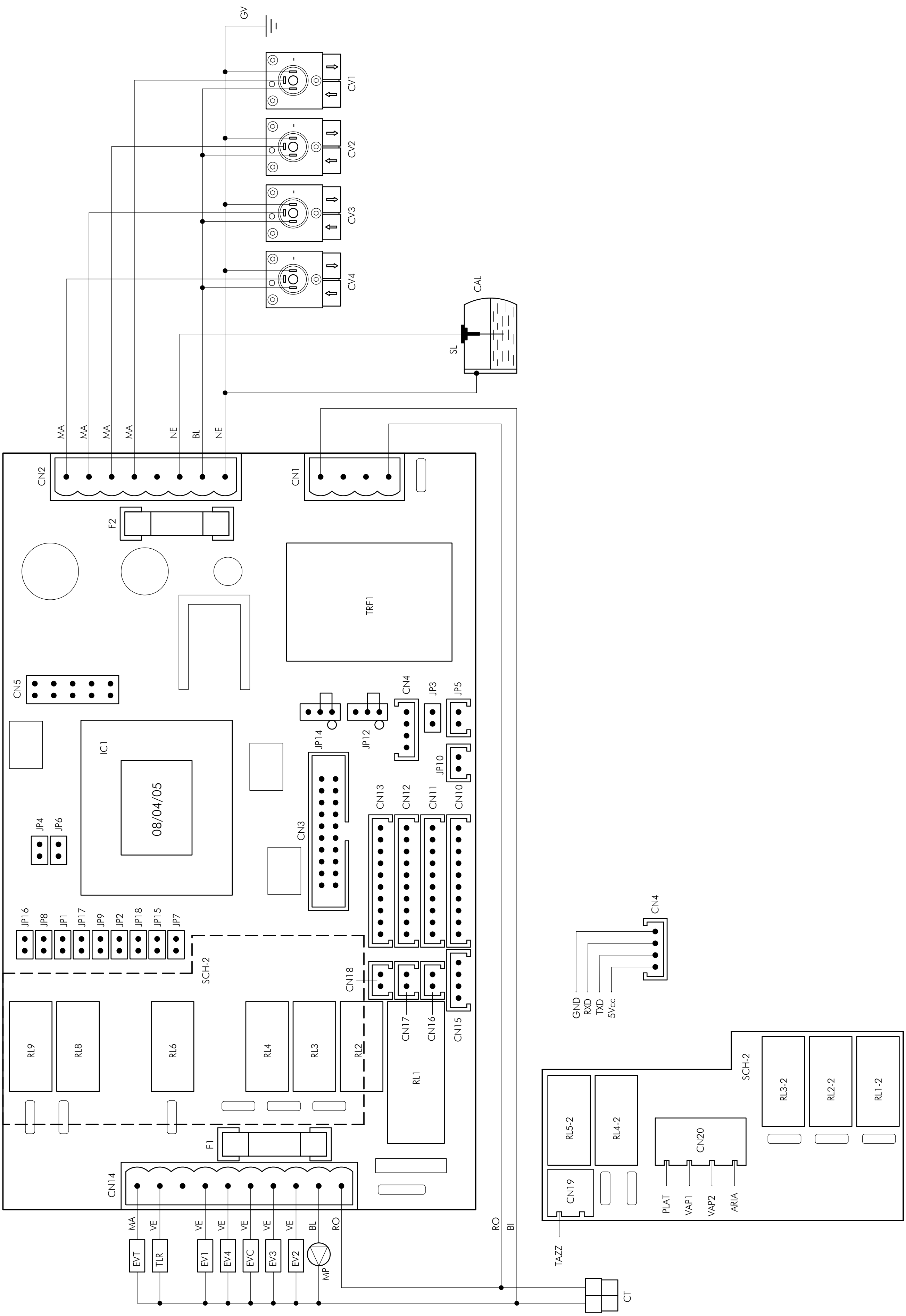
		INSERTED	**NOT INSERTED**
JP1	Serial transmission	Enabled	Disabled
JP2	Pre-infusion	Enabled	Disabled
JP3	Programming		
JP4	Boiler filling	With pump	Without pump
JP5	Tea delivery		
JP6	Tea	With pump	Without pump
JP7	STOP key continuation	Disabled	Enabled
JP8	Not managed		
JP9	Credit-Debt	Enabled	Disabled
JP10	Not managed		
JP12	Not managed		
JP14	Not managed		
JP15	Display function keys **(*)**	Enabled	Disabled
JP16	Device	6-key dosing	4-key dosing
JP17	Not managed		
JP18	Not managed		

JP15(*) For version whitout DISPLAY: not managed

Configuration JP12- JP14



6.14 Schema elettrico cod. 18090051-52 *GLORIA-SIBILLA DISPLAY* **PLUS 3 rev.0**

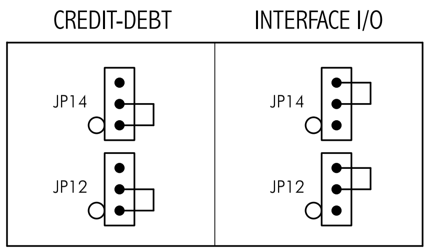


CN1	Power supply connector
CN2	Low voltage power supply
CN3	Display connector
CN4	Serial transmission connector
CN5	Microprocessor connector
CN10	Push button panel connector GR1
CN11	Push button panel connector GR2
CN12	Push button panel connector GR3
CN13	Push button panel connector GR4
CN14	Service outputs connector
CN15	Connector pressure switch
CN16	Connector autosteamer NTC
CN17	Connector boiler NTC
CN18	Connector Cup heater NTC
CN19	Connector Cup heater heating el.
CN20	Connector cappuccino maker
CT	Power supply connector
CAL	Boiler
IC1	Microprocessor
MP	Pump
TLR	Remote switch
TRF1	Transformer
BI	White
BL	Blue
GV	Yellow-green
MA	Brown
NE	Black
RO	Red
VE	Green

CV1	Volumetric counter GR1
CV2	Volumetric counter GR2
CV3	Volumetric counter GR3
CV4	Volumetric counter GR4
EV1	Solenoid valve GR1
EV2	Solenoid valve GR2
EV3	Solenoid valve GR3
EV4	Solenoid valve GR4
EVC	Filling solenoid valve Boiler
EVT	Tea solenoid valve
ARIA	Solenoid valve air
PLAT	Solenoid valve cold milk
TAZZ	Cup heater
VAP1	Solenoid valve steam hot milk
VAP2	Solenoid valve autosteamer
F1	Ouputs fuse (6,3A)
F2	Inputs fuse (500mA)
RL1	Solenoid valve relay Pump
RL2	Solenoid valve relay GR2
RL3	Solenoid valve relay GR3
RL4	Solenoid valve relay Boiler
RL5	Solenoid valve relay GR4
RL6	Solenoid valve relay GR1
RL8	Boiler heating element relay
RL9	Solenoid valve relay Tea
RL1-2	Solenoid valve cappuccino maker
RL2-2	Solenoid valve relay autosteamer
RL3-2	Solenoid valve relay air
RL4-2	Solenoid valve relay milk pump
RL5-2	Solenoid valve relay cup heater

		INSERTED	NOT INSERTED
JP1	Serial transmission	Enabled	Disabled
JP2	Not managed		
JP3	Programming		
JP4	Boiler filling	With pump	Without pump
JP5	Tea delivery		
JP6	Tea	With pump	Without pump
JP7	STOP key continuation	Disabled	Enabled
JP8	Pump cold milk	Enabled	Disabled
JP9	Credit-Debt	Enabled	Disabled
JP10	Not managed		
JP12	Not managed		
JP14	Not managed		
JP15	Display function keys	Key gr.1	Display
JP16	Device	6-key dosing	4-key dosing
JP17	Not managed		
JP18	Not managed		

Configuration JP12- JP14



Checking temperature boiler / pressure	
JP17 closed + JP 18 closed	Whit cappuccino maker
JP17 closed + JP 18 open	Whit electronic system

ESPRESSO COFFEE MACHINE

USE AND MAINTENANCE MANUAL

Instructions for the technician

INTERFACE SYSTEM

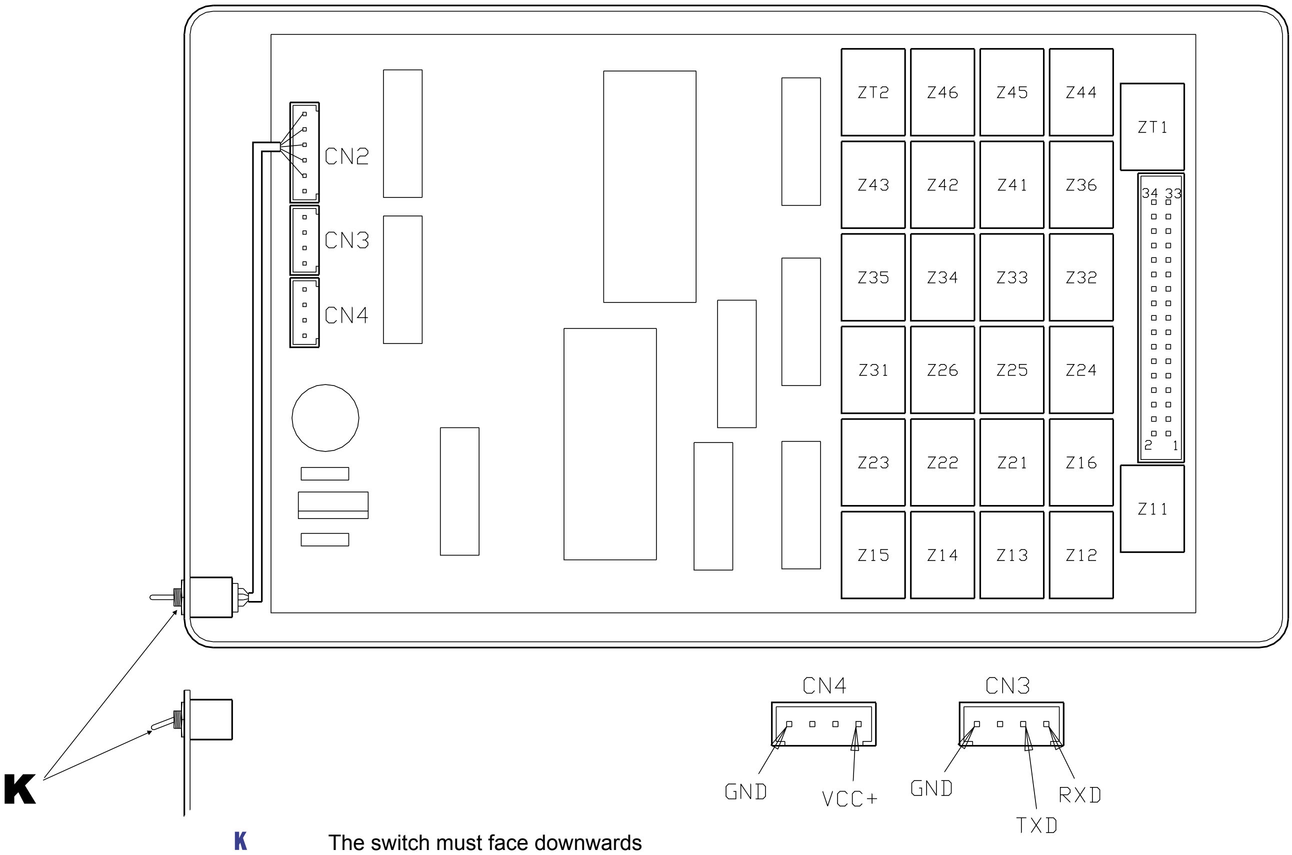
ENGLISH

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Summary

1. ASTORIA interface system

1.1 MACHINE - INTERFACE connection



K The switch must face downwards

Note To enable the interface, short circuit pins 33/34 of CN1

PIN	RELAY	GROUP	DOSE KEY
1	Z11	1	1
2	Z12	1	2
3	Z13	1	3
4	Z14	1	4
5	Z15	1	5
6	Z16	1	6
7	Z21	2	1
8	Z22	2	2
9	Z23	2	3
10	Z24	2	4
11	Z25	2	5
12	Z26	2	6
13	Z31	3	1
14	Z32	3	2
15	Z33	3	3
16	Z34	3	4
17	Z35	4	5

PIN	RELAY	GROUP	DOSE KEY
18	Z36	4	6
19	Z41	4	1
20	Z42	4	2
21	Z43	4	3
22	Z44	4	4
23	Z45	4	5
24	Z46	4	6
25	ZT1		TEA
26	ZT2		
27			
28			
29	HTW common signals		
30	HTW common signals		
31			
32			
33			ABHART*
34			GND*

1.2 ARGENTA type machine system

Components to be used in the INTERFACE - COFFEE MACHINE connection:

- Code 26001 26-relay interface
- Code 22550 Hartwall cable
- Code 22551 Power cable
- Code 22552 8-pole serial transmission cable

1.3 DIVINA type machine system

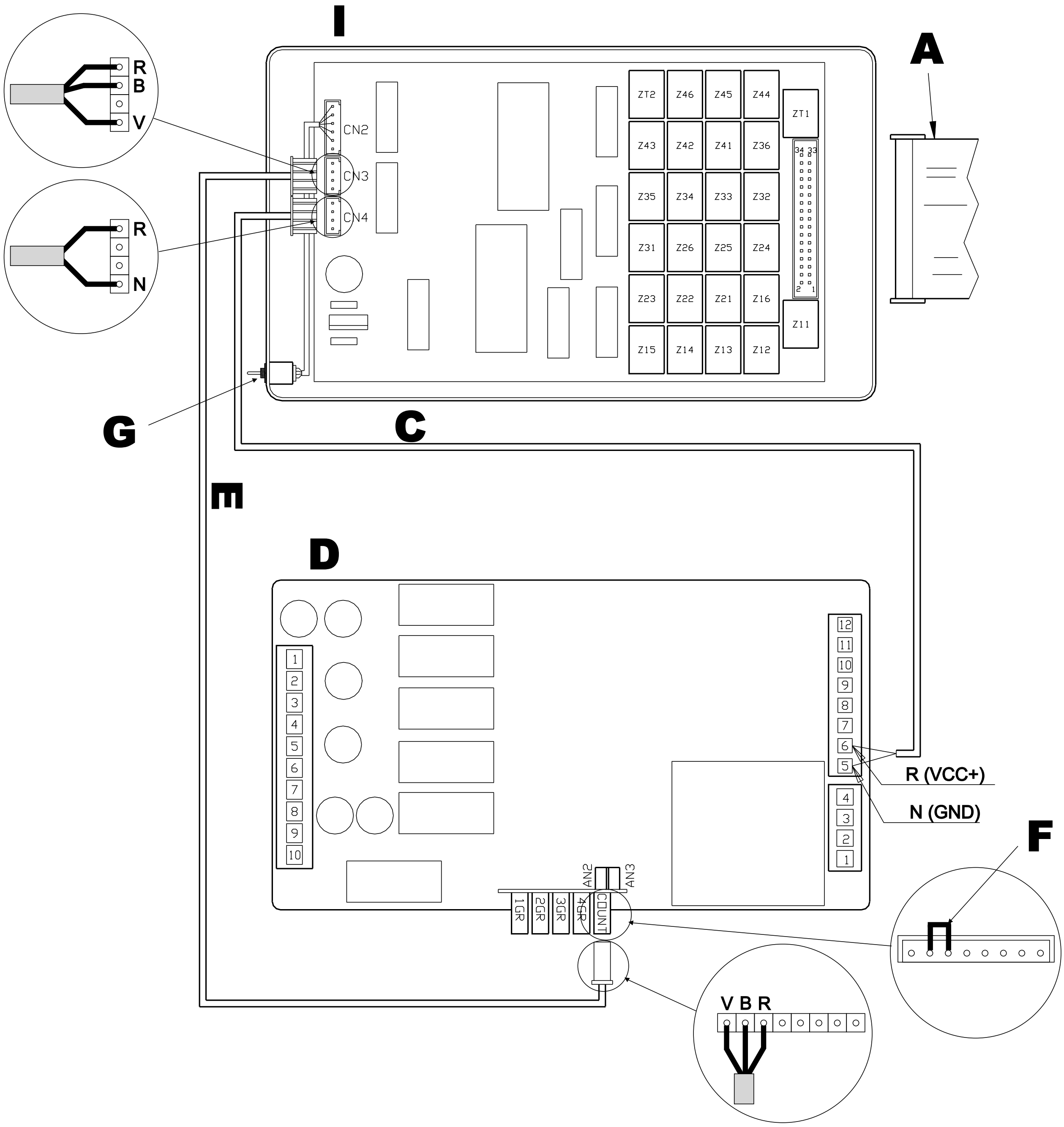
Components to be used in the INTERFACE - COFFEE MACHINE connection:

- Code 26011 26-relay interface
- Code 22550 Hartwall cable
- Code 22551 Power cable
- Code 22555 4-pole serial transmission cable

Also, replace the microprocessor according to the following rule:

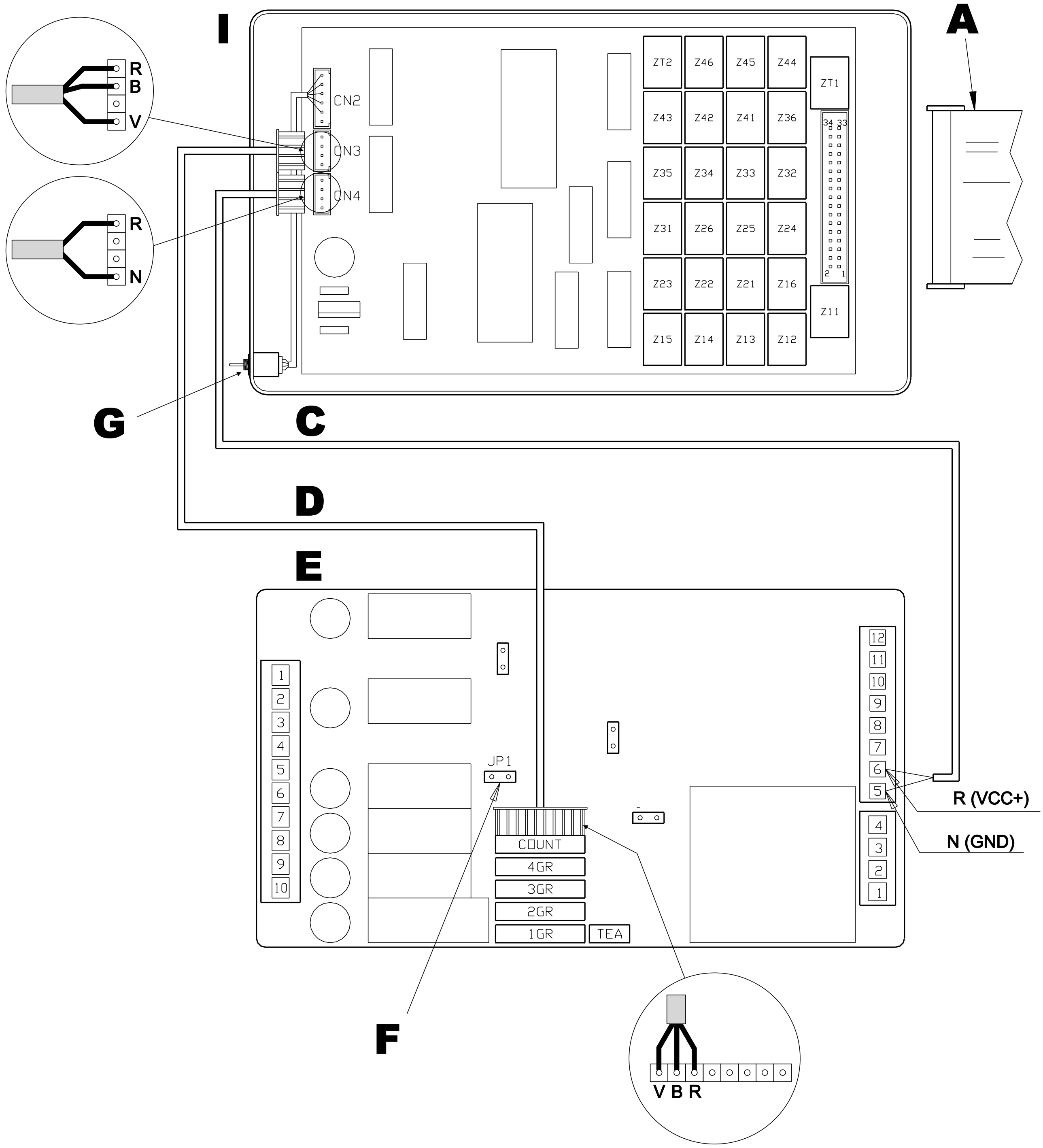
- if the GICAR control unit uses code 4GR8T 13/10/01
- If the GIEMME control unit uses code D4DEG-R 12/03/03 as shown in the drawings

1.4 ARGENTA type machine electrical diagram version *GICAR*



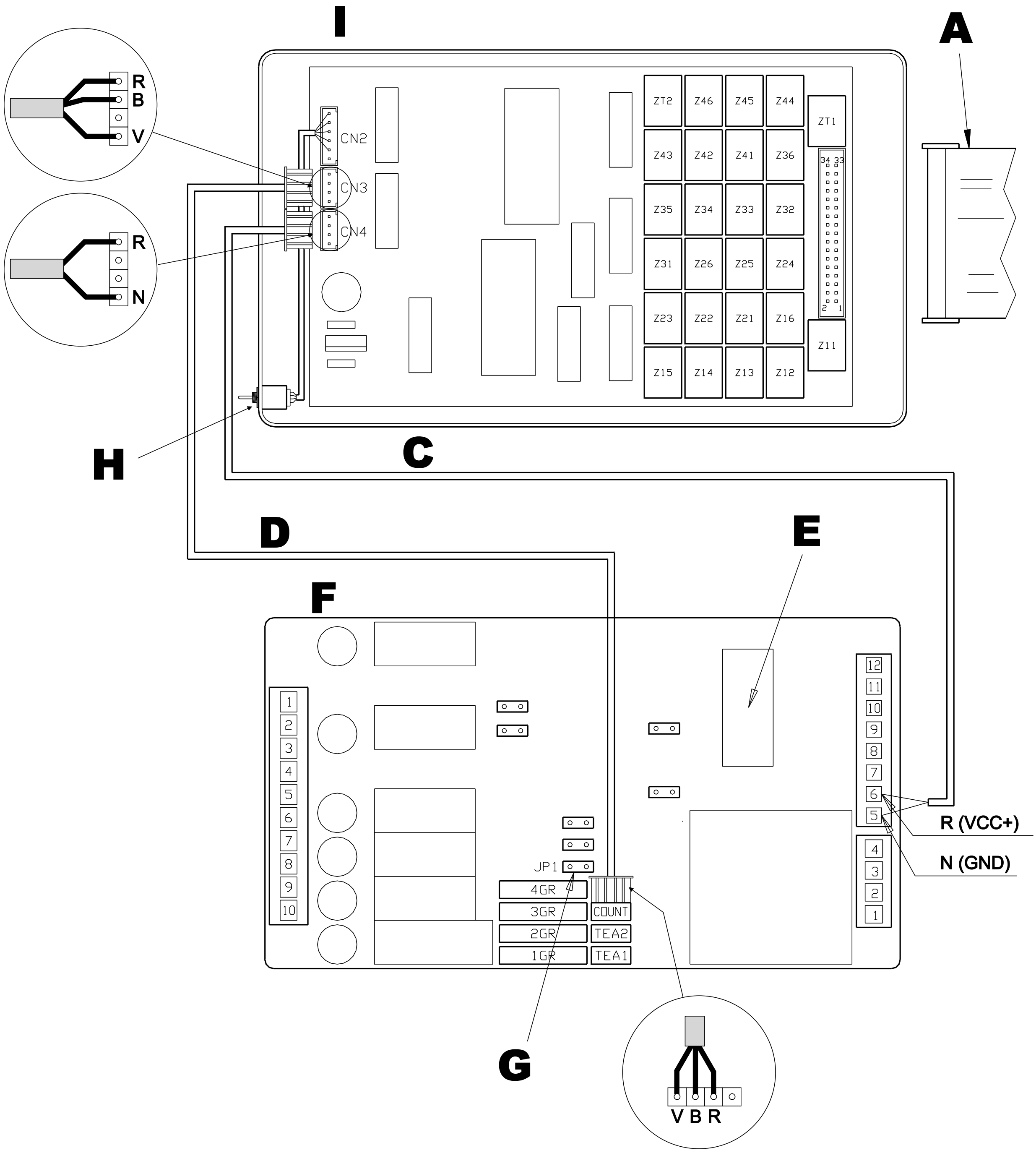
REF.	DESCRIPTION
A	Hartwall cable 8.9.28.51 code 22550
B	White
C	Power cable 8.9.28.12 code 22551
D	Dosing
E	Serial transmission cable 8.9.28.13 code 22552
F	Remove the jumper before connecting the serial cable
G	Place the lever in the PROG position only when programming coffee doses
I	Interface
N	Black
R	Red
V	Green

1.5 ARGENTA type machine electrical diagram version *GIEMME*



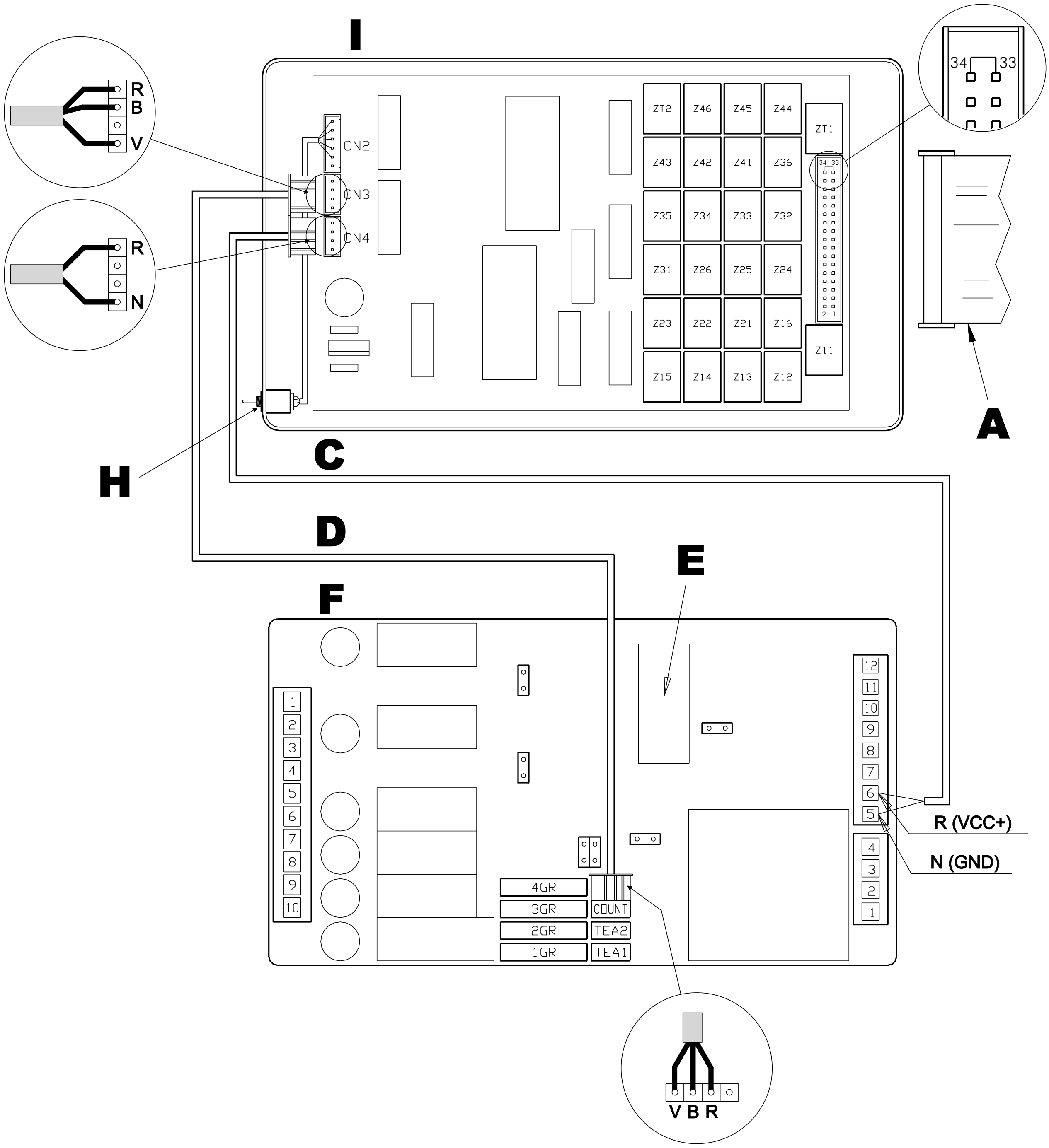
REF.	DESCRIPTION
A	Hartwall cable 8.9.28.51 code 22550
B	White
C	Power cable 8.9.28.12 code 22551
D	Serial transmission cable 8.9.28.13 code 22552
E	Dosing
F	Short circuit JP1
G	Never place the lever in the PROG position
I	Interface
N	Black
R	Red
V	Green

1.6 DIVINA type machine electrical diagram version *GICAR*



REF.	DESCRIPTION
A	Hartwall cable 8.9.28.51 code 22550
B	White
C	Power cable 8.9.28.12 code 22551
D	Serial transmission cable code 22555
E	Replace with correct version
F	Dosing
G	Short circuit JP1
H	Place the lever in the PROG position only when programming coffee doses
I	Interface
N	Black
R	Red
V	Green

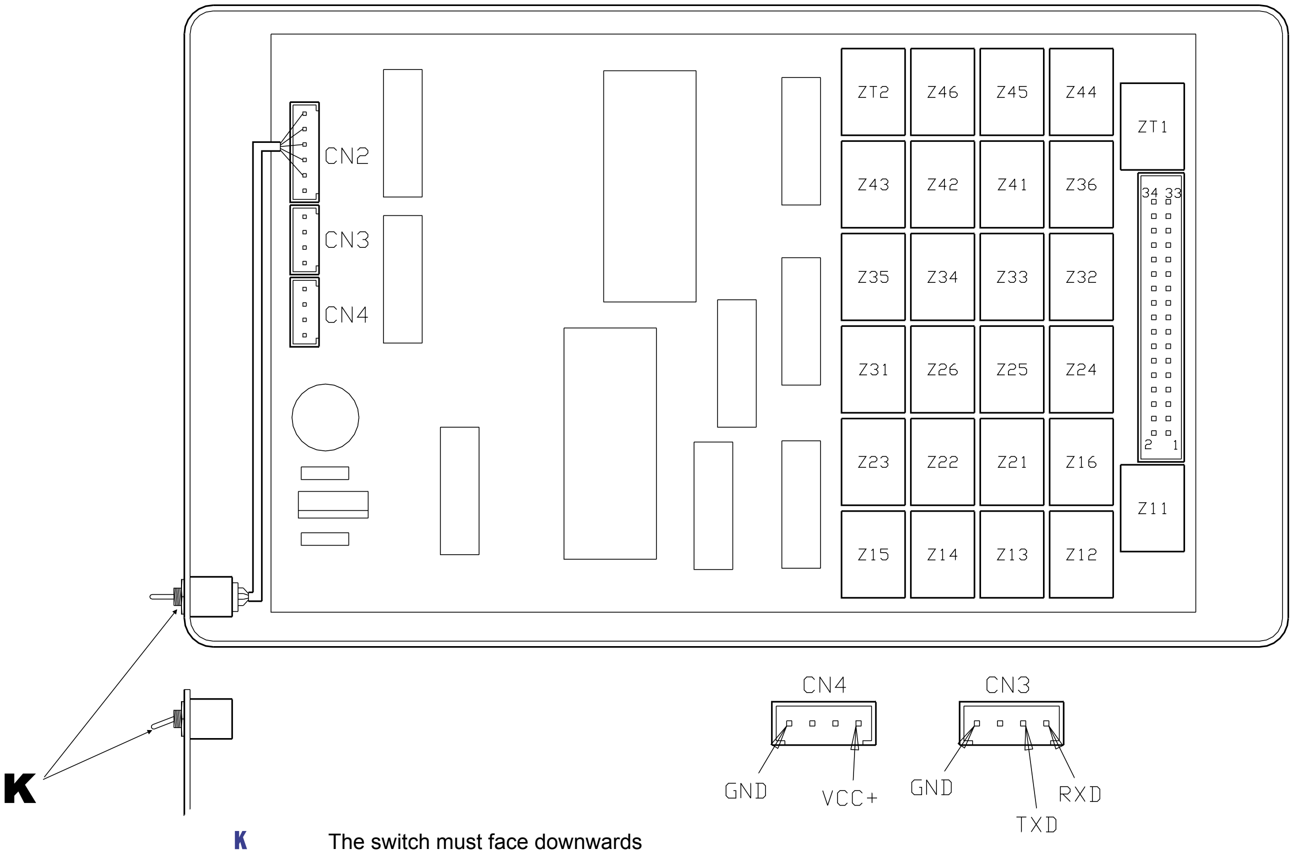
1.7 DIVINA type machine electrical diagram version *GIEMME*



REF.	DESCRIPTION
A	Hartwall cable 8.9.28.51 code 22550
B	White
C	Power cable 8.9.28.12 code 22551
D	Serial transmission cable code 22555
E	Replace with correct version
F	Dosing
G	Do not short circuit JP1
H	Never place the lever in the PROG position
I	Interface
N	Black
R	Red
V	Green

2. SAN MARINO interface system

2.1 MACHINE - INTERFACE connection



K The switch must face downwards
Note To enable the interface, short circuit pins 33/34 of CN1

PIN	RELAY	GROUP	DOSE KEY
1	Z11	1	1
2	Z12	1	2
3	Z13	1	3
4	Z14	1	4
5	Z15	1	5
6	Z16	1	6
7	Z21	2	1
8	Z22	2	2
9	Z23	2	3
10	Z24	2	4
11	Z25	2	5
12	Z26	2	6
13	Z31	3	1
14	Z32	3	2
15	Z33	3	3
16	Z34	3	4
17	Z35	4	5

PIN	RELAY	GROUP	DOSE KEY
18	Z36	4	6
19	Z41	4	1
20	Z42	4	2
21	Z43	4	3
22	Z44	4	4
23	Z45	4	5
24	Z46	4	6
25	ZT1		TEA
26	ZT2		
27			
28			
29	HTW common signals		
30	HTW common signals		
31			
32			
33			ABHART*
34			GND*

2.2 LISA type machine system

Components to be used in the INTERFACE - COFFEE MACHINE connection:

- Code 26011 26-relay interface
- Code 22550 Hartwall cable
- Code 22551 Power cable
- Code 22552 8-pole serial transmission cable

2.3 BRAVA type machine system

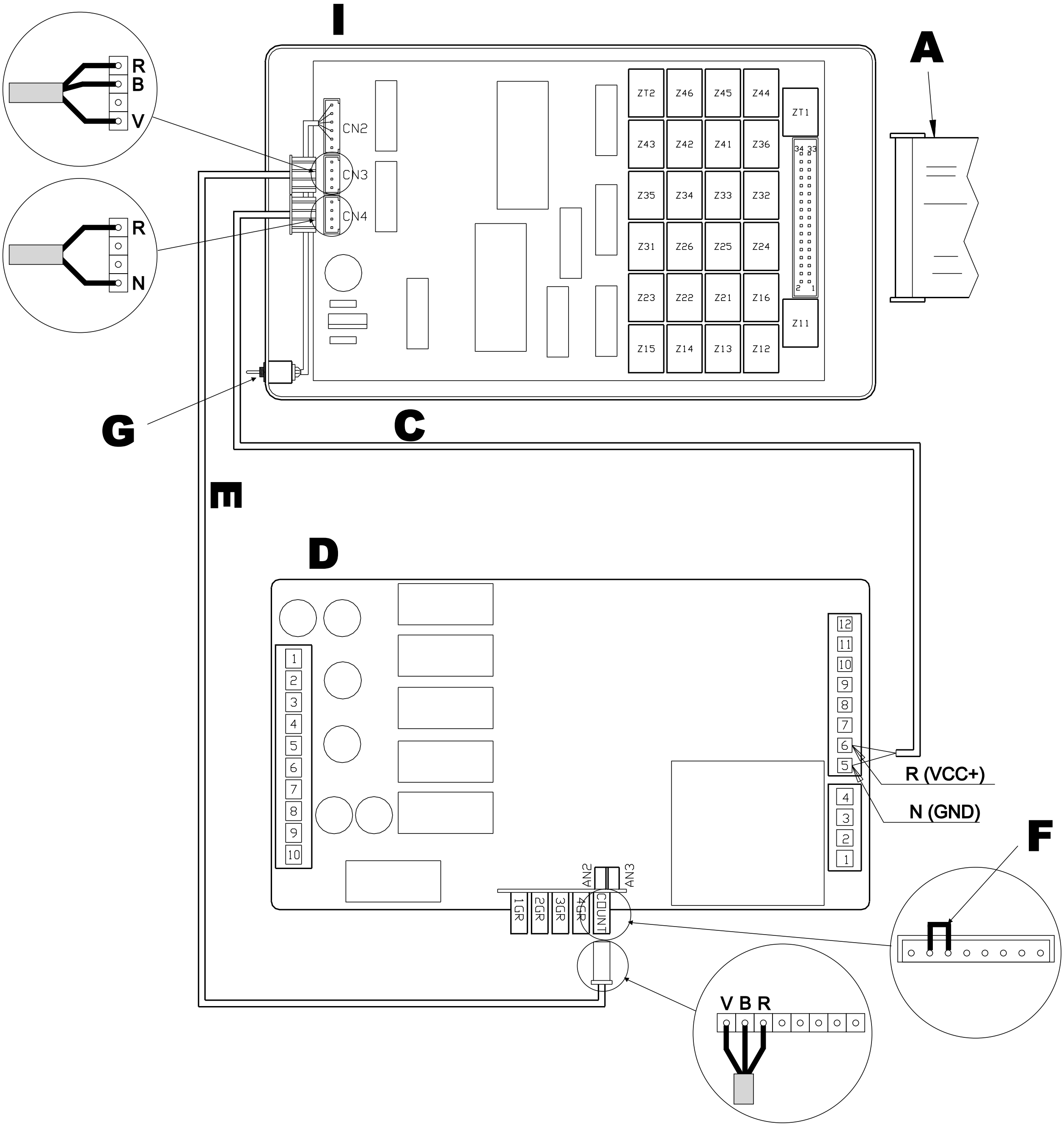
Components to be used in the INTERFACE - COFFEE MACHINE connection:

- Code 26011 26-relay interface
- Code 22550 Hartwall cable
- Code 22551 Power cable
- Code 22555 4-pole serial transmission cable

Also, replace the microprocessor according to the following rule:

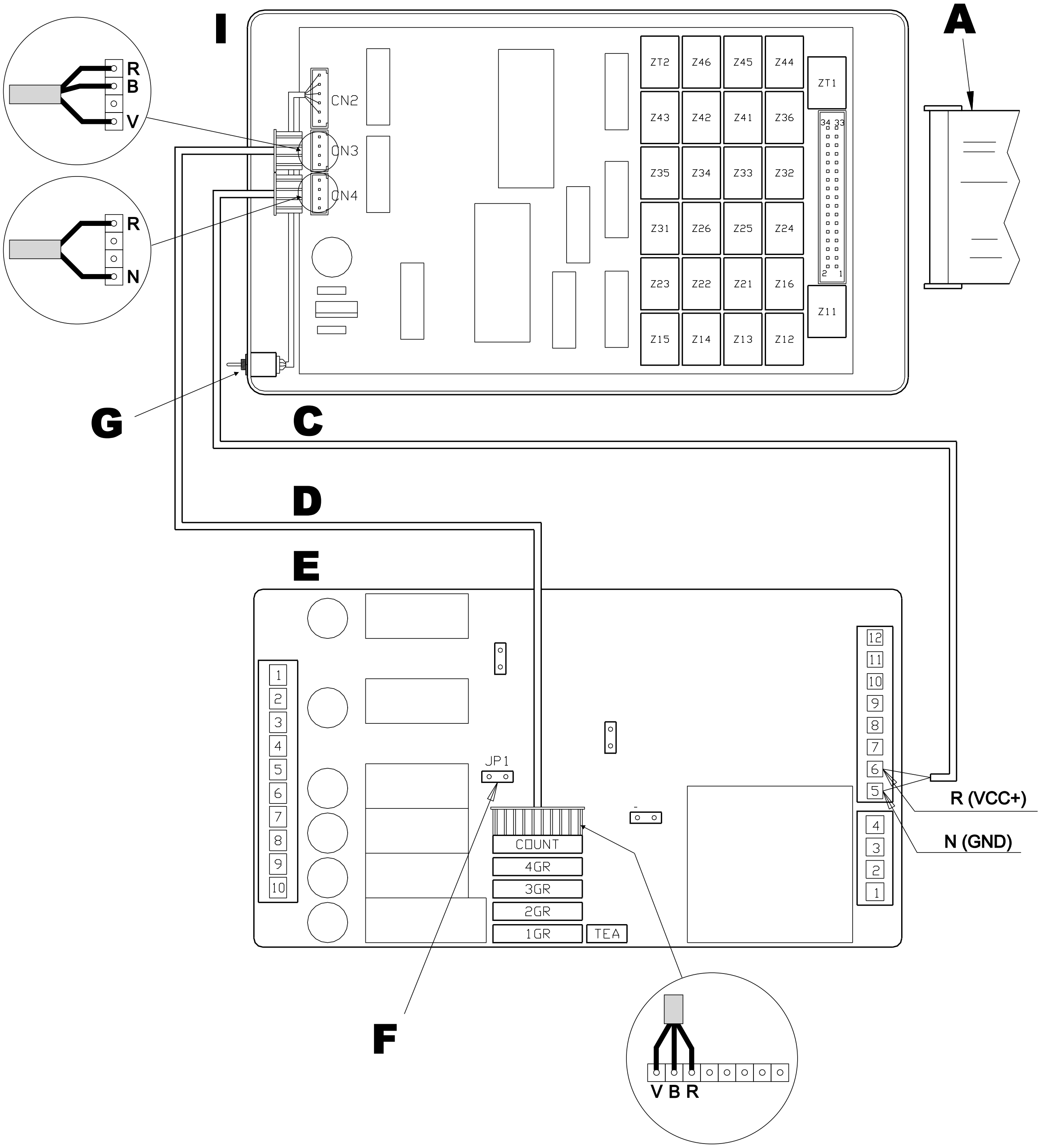
- if the GICAR control unit uses code 4GR8T 13/10/01
- If the GIEMME control unit uses code D4DEG-R 12/03/03 as shown in the drawings

2.4 LISA type machine electrical diagram version *GICAR*



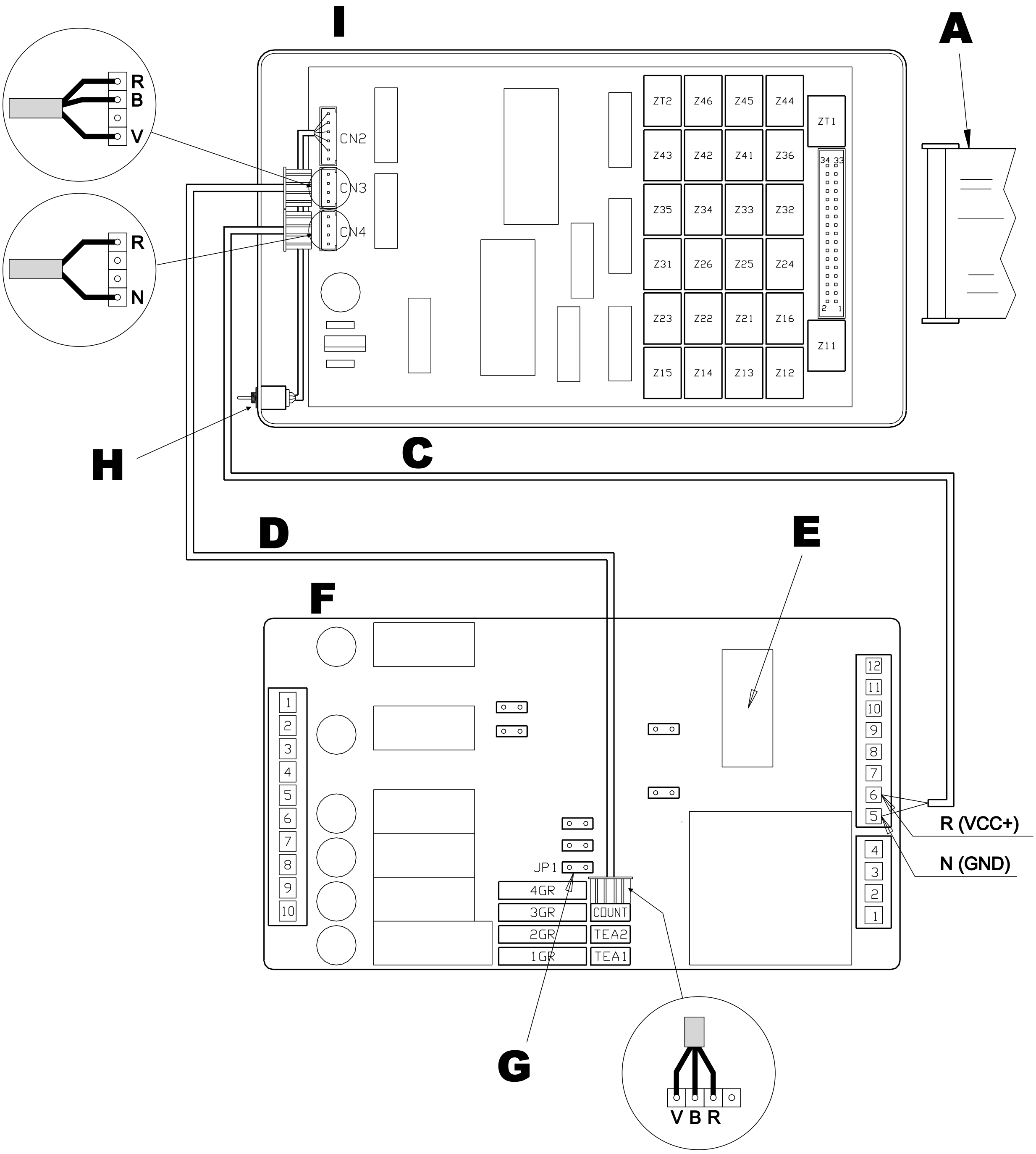
REF.	DESCRIPTION
A	Hartwall cable 8.9.28.51 code 22550
B	White
C	Power cable 8.9.28.12 code 22551
D	Dosing
E	Serial transmission cable 8.9.28.13 code 22552
F	Remove the jumper before connecting the serial cable
G	Place the lever in the PROG position only when programming coffee doses
I	Interface
N	Black
R	Red
V	Green

2.5 LISA type machine electrical diagram version*GIEMME*



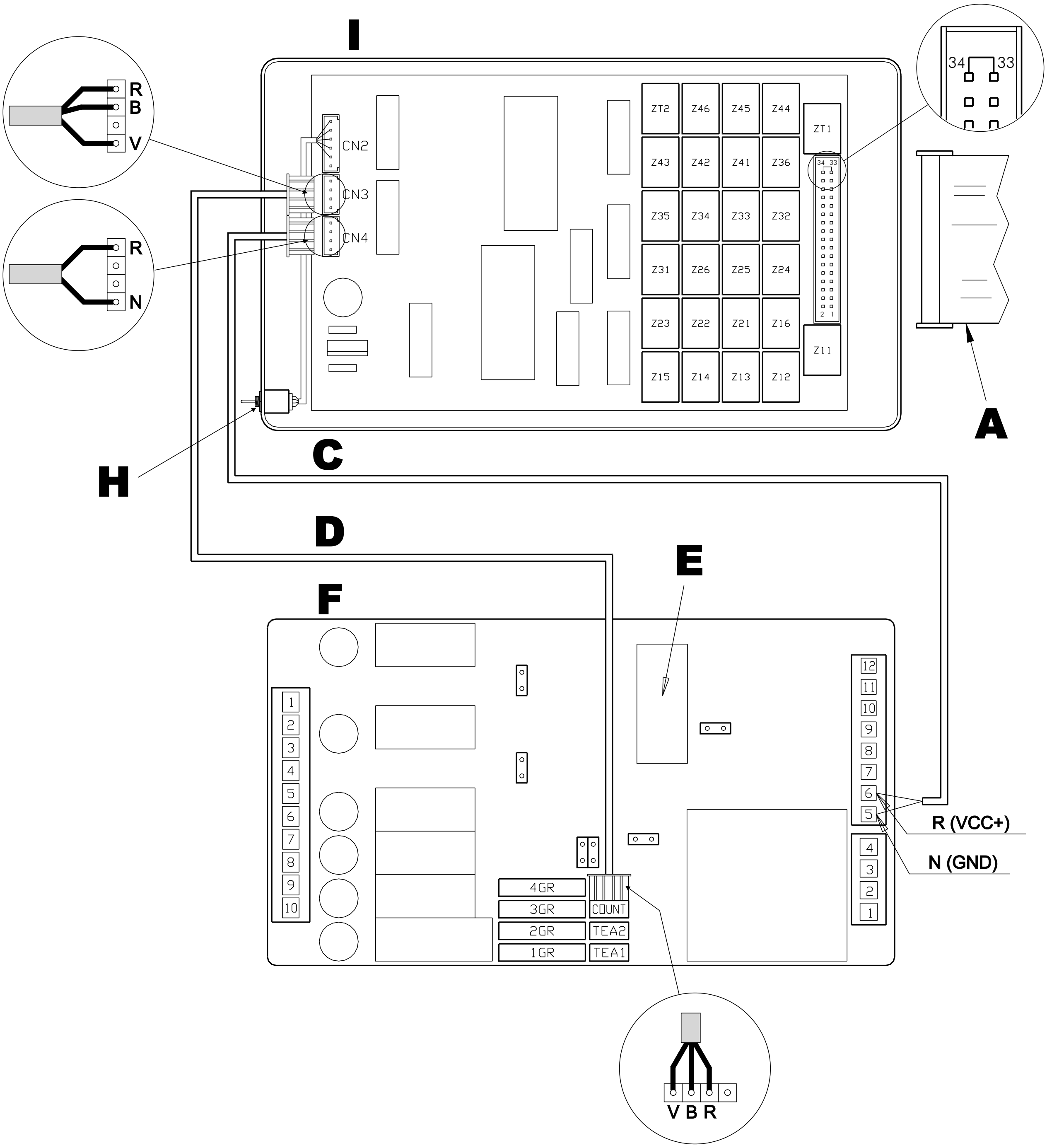
REF.	DESCRIPTION
A	Hartwall cable 8.9.28.51 code 22550
B	White
C	Power cable 8.9.28.12 code 22551
D	Serial transmission cable 8.9.28.13 code 22552
E	Dosing
F	Short circuit JP1
G	Never place the lever in the PROG position
I	Interface
N	Black
R	Red
V	Green

2.6 BRAVA type machine electrical diagram version *GICAR*



REF.	DESCRIPTION
A	Hartwall cable 8.9.28.51 code 22550
B	White
C	Power cable 8.9.28.12 code 22551
D	Serial transmission cable code 22555
E	Replace with correct version
F	Dosing
G	Short circuit JP1
H	Place the lever in the PROG position only when programming coffee doses
I	Interface
N	Black
R	Red
V	Green

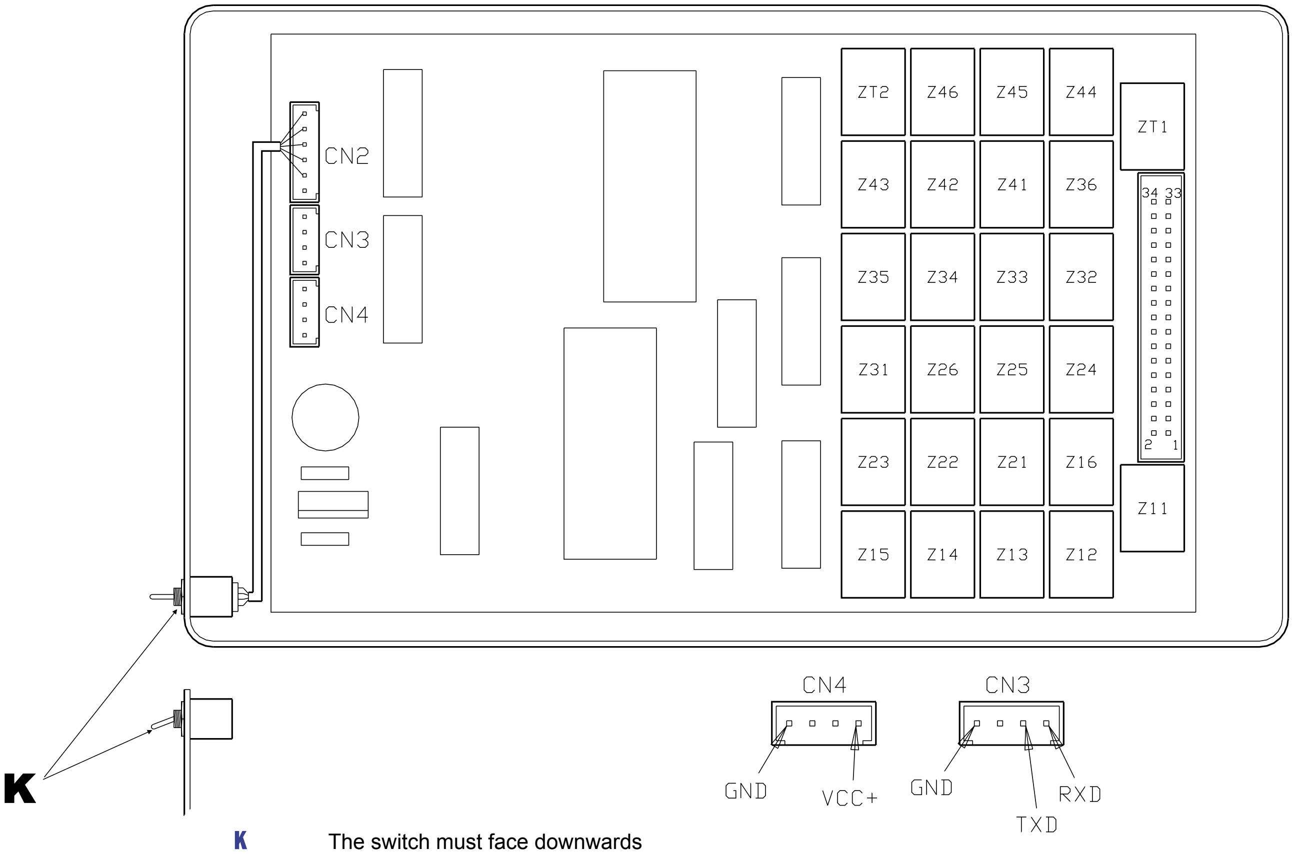
2.7 BRAVA type machine electrical diagram version *GIEMME*



REF.	DESCRIPTION
A	Hartwall cable 8.9.28.51 code 22550
B	White
C	Power cable 8.9.28.12 code 22551
D	Serial transmission cable code 22555
E	Replace with correct version
F	Dosing
G	Do not short circuit JP1
H	Never place the lever in the PROG position
I	Interface
N	Black
R	Red
V	Green

3. SIBILLA - GLORIA interface system

3.1 MACHINE - INTERFACE connection



K The switch must face downwards

Note To enable the interface, short circuit pins 33/34 of CN1

PIN	RELAY	GROUP	DOSE KEY
1	Z11	1	1
2	Z12	1	2
3	Z13	1	3
4	Z14	1	4
5	Z15	1	5
6	Z16	1	6
7	Z21	2	1
8	Z22	2	2
9	Z23	2	3
10	Z24	2	4
11	Z25	2	5
12	Z26	2	6
13	Z31	3	1
14	Z32	3	2
15	Z33	3	3
16	Z34	3	4
17	Z35	4	5

PIN	RELAY	GROUP	DOSE KEY
18	Z36	4	6
19	Z41	4	1
20	Z42	4	2
21	Z43	4	3
22	Z44	4	4
23	Z45	4	5
24	Z46	4	6
25	ZT1		TEA
26	ZT2		
27			
28			
29	HTW common signals		
30	HTW common signals		
31			
32			
33			ABHART*
34			GND*

3.2 Sibilla 2003 type machine system

Interface Kit code 83260002R

Components to be used in the INTERFACE - COFFEE MACHINE connection:

- Code 26011 26-relay interface
- Code 22550 Hartwall cable
- Code 22551 Power cable
- Code 22555 4-pole serial transmission cable

WARNING

- This type of control unit has been replaced with the “PLUS 1-2” version, see **Sibilla 2004 - Gloria**
- If the microprocessor carries a date prior to 23 June 2004,
  replace it with one dated after 23 June 2004:
  - 18090038 with display
  - 18090048 without display

3.3 Sibilla 2004 / Gloria PLUS 1-2 type machine system

Interface Kit code 83260002R

Components to be used in the INTERFACE - COFFEE MACHINE connection:

- Code 26011 26-relay interface
- Code 22550 Hartwall cable
- Code 22551 Power cable
- Code 22555 4-pole serial transmission cable

3.4 Gloria - PLUS 3 type machine system

Interface Kit code 83260033R

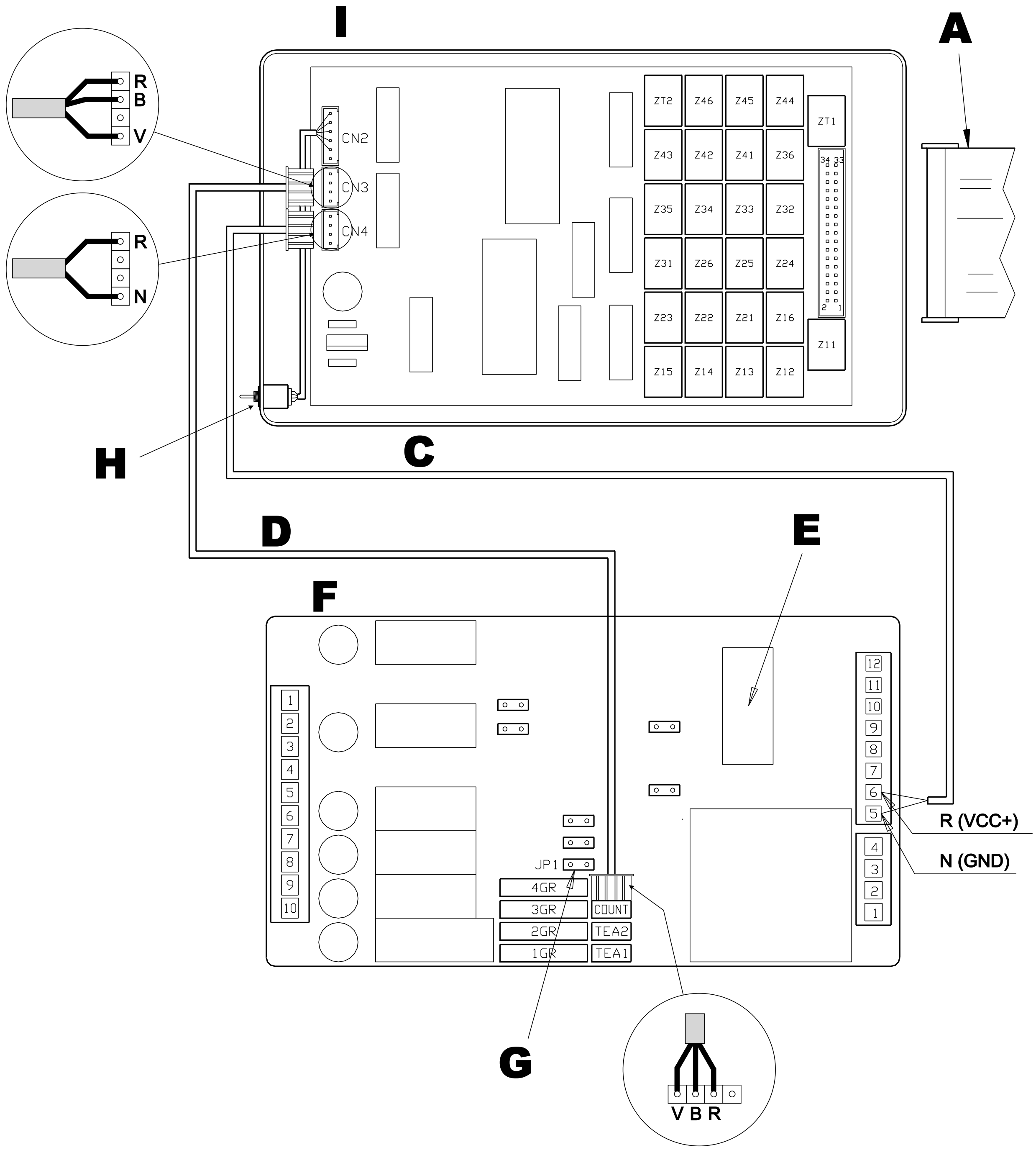
Components to be used in the INTERFACE - COFFEE MACHINE connection:

- Code 26016 32-relay interface
- Code 22554004 Hartwall cable
- Code 22551 Power cable
- Code 22555 4-pole serial transmission cable

WARNING

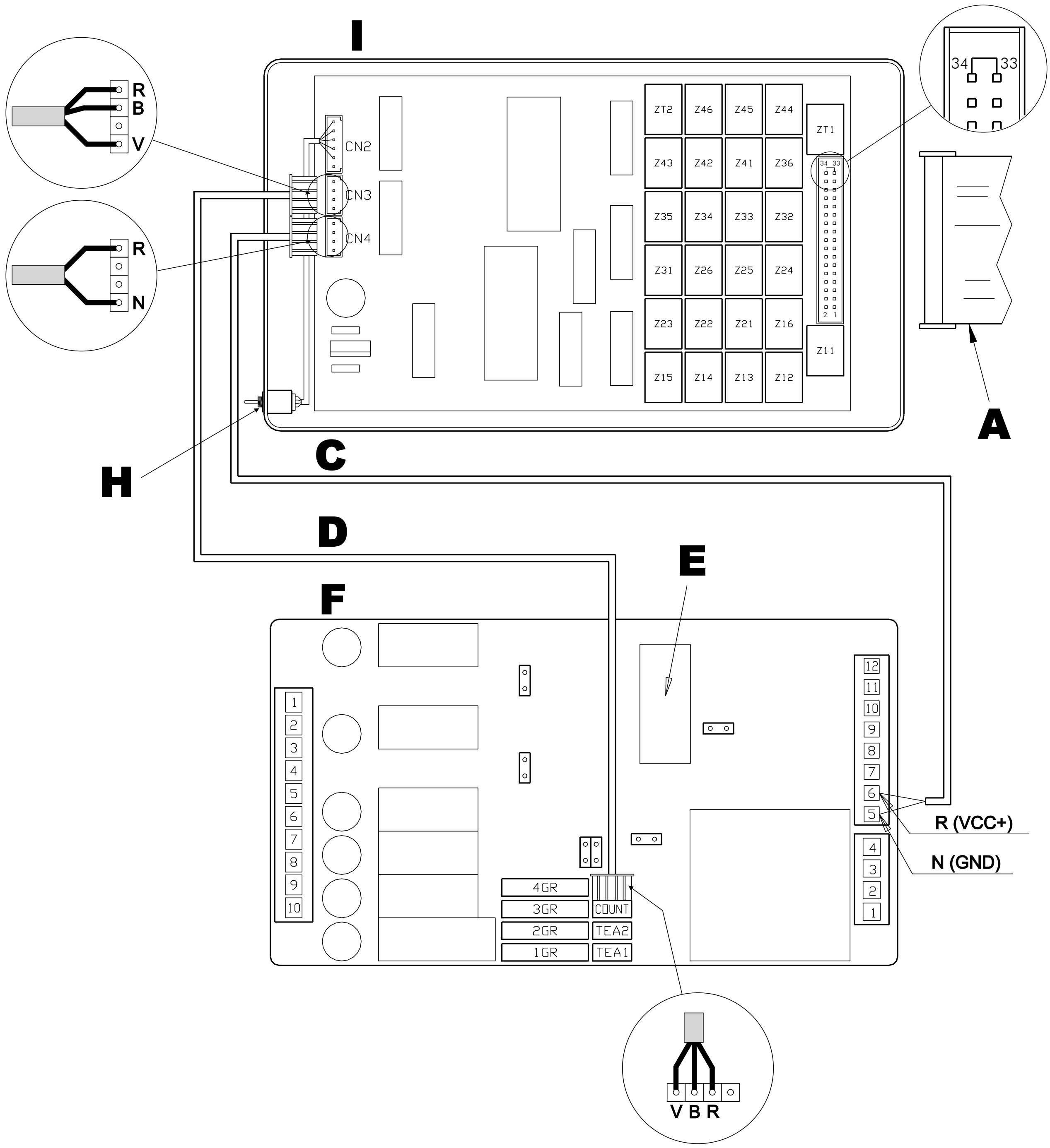
- If the microprocessor carries a date prior to 8 June 2004,
  replace it with one dated after 8 May 2005

3.5 Sibilla 2003 type machine electrical diagram version *GICAR*



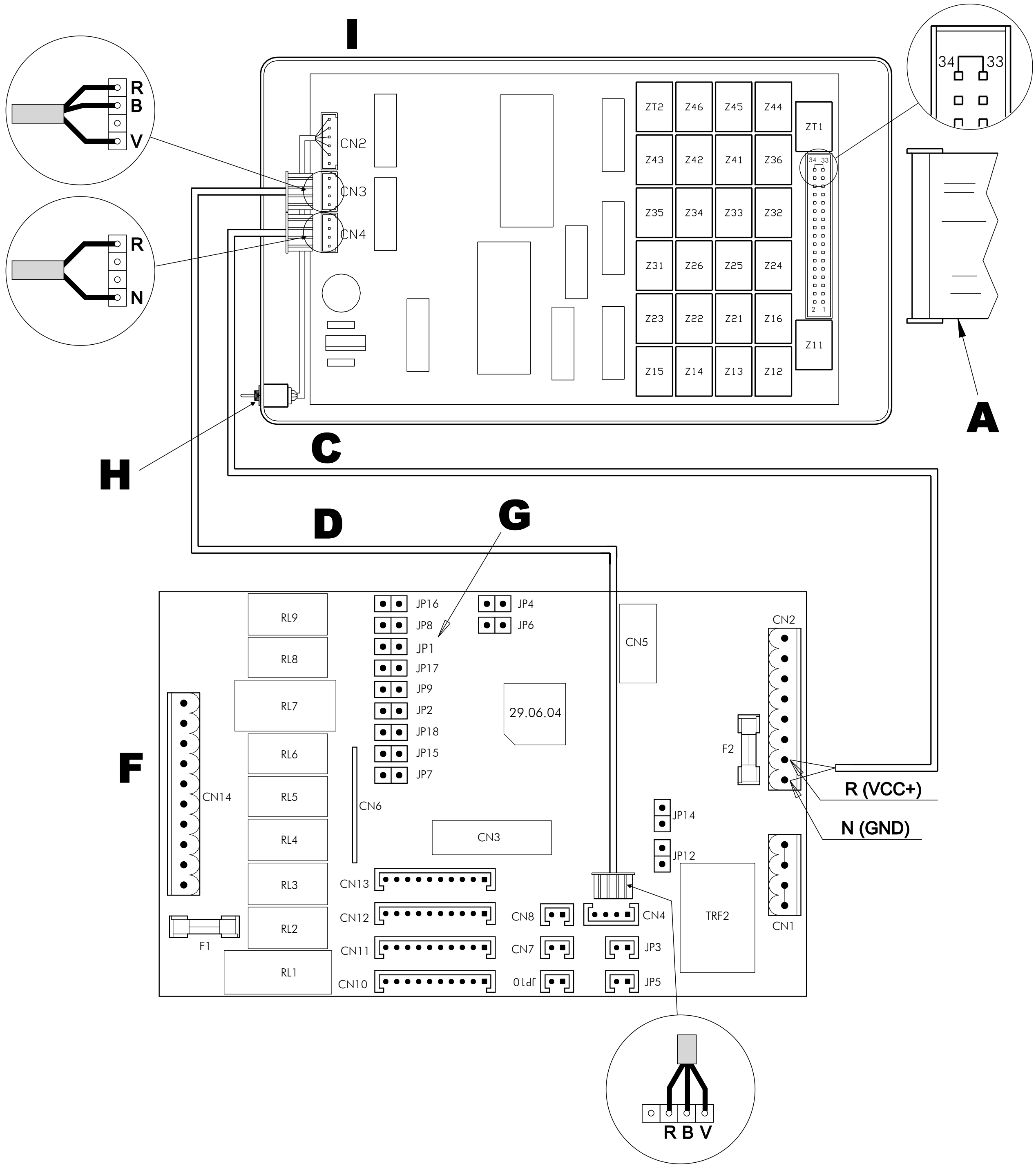
REF.	DESCRIPTION
A	Hartwall cable 8.9.28.51 code 22550
B	White
C	Power cable 8.9.28.12 code 22551
D	Serial transmission cable code 22555
E	Replace with correct version
F	Dosing
G	Short circuit JP1
H	Place the lever in the PROG position only when programming coffee doses
I	Interface
N	Black
R	Red
V	Green

3.6 Sibilla 2003 type machine electrical diagram version *GIEMME*



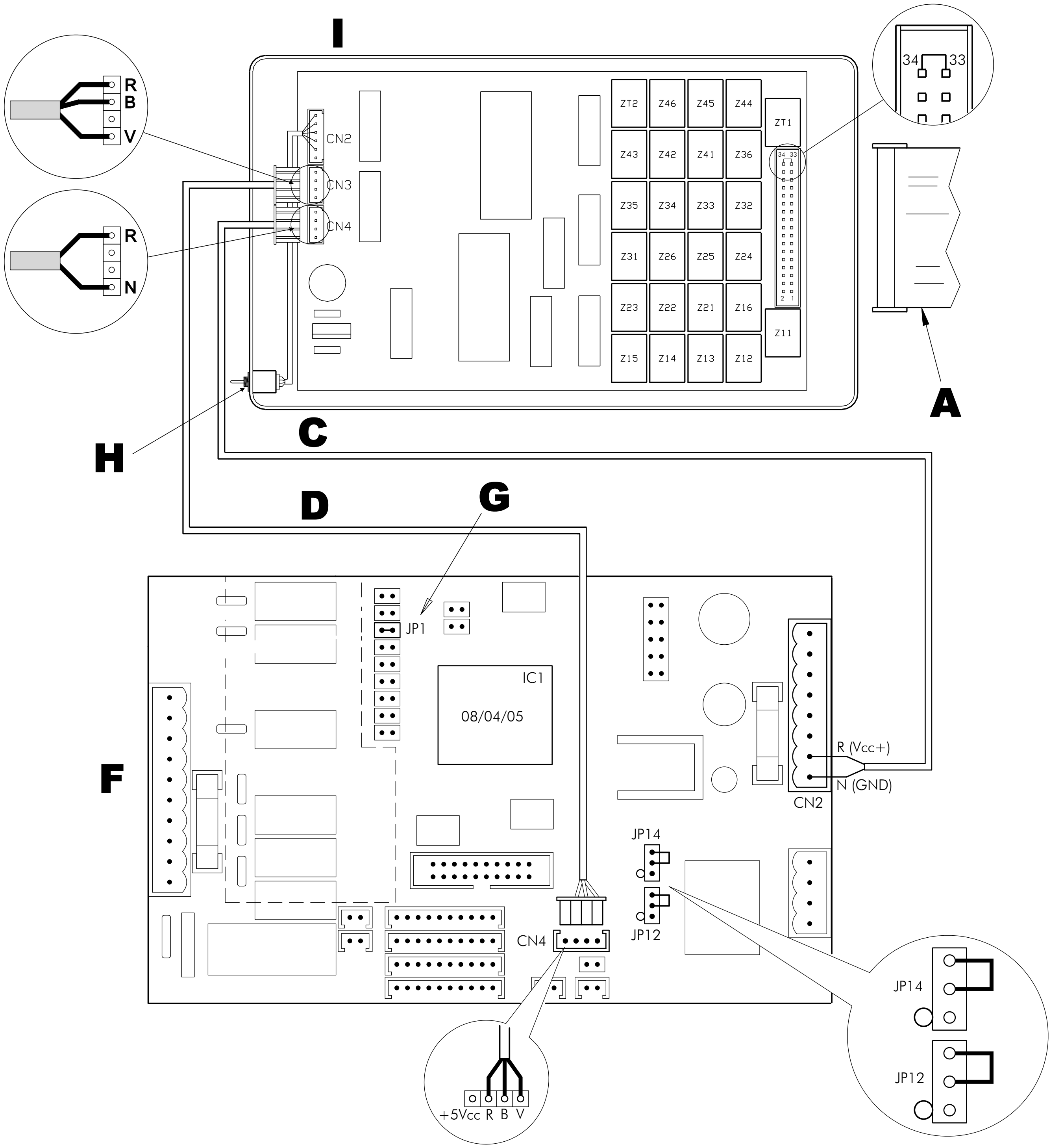
REF.	DESCRIPTION
A	Hartwall cable 8.9.28.51 code 22550
B	White
C	Power cable 8.9.28.12 code 22551
D	Serial transmission cable code 22555
E	Replace with correct version
F	Dosing
H	Never place the lever in the PROG position
I	Interface
N	Black
R	Red
V	Green
33 - 34	Enabling

3.7 Sibilla 2004 / Gloria - PLUS 1-2 type machine electrical diagram (OLD version)



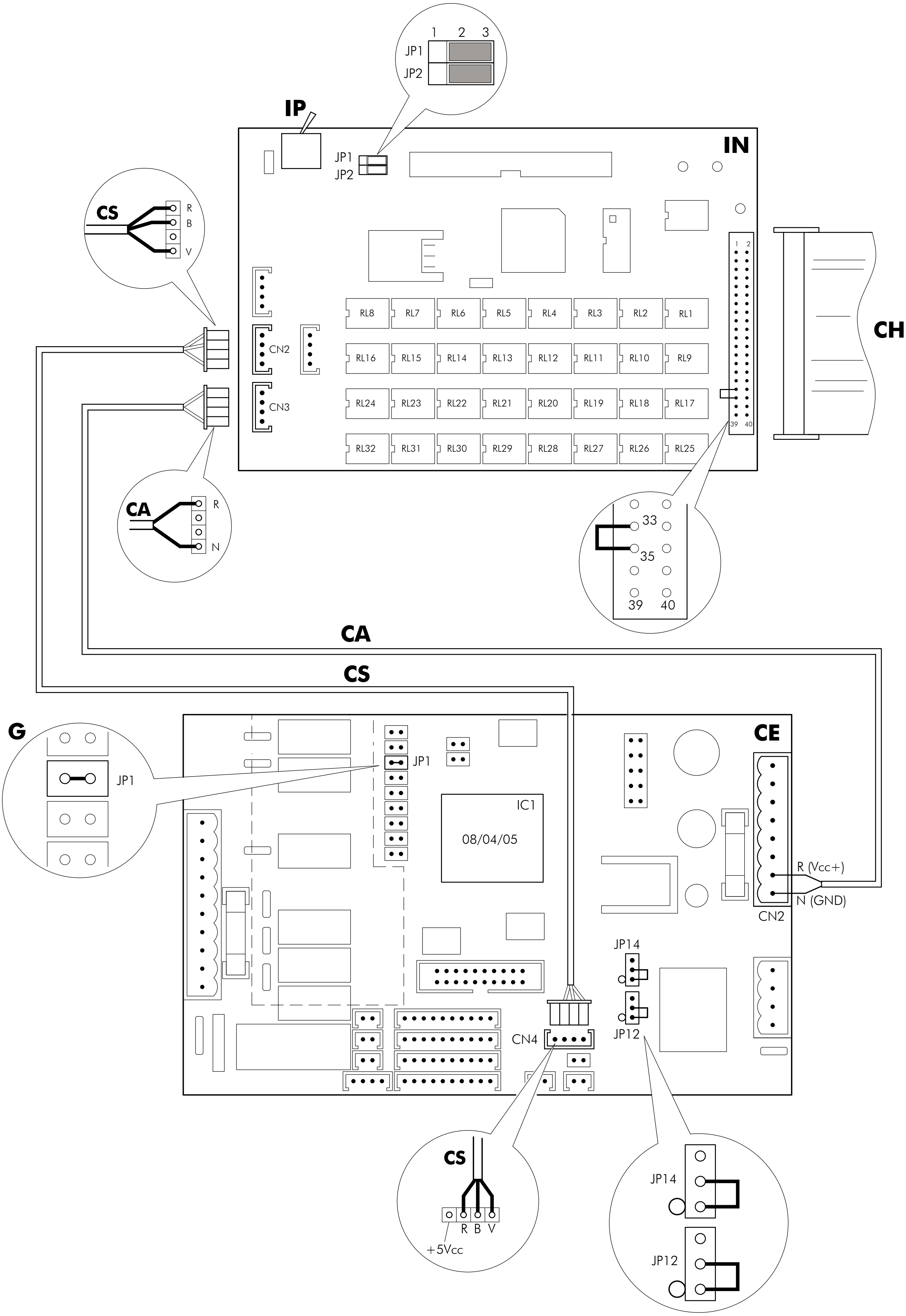
REF.	DESCRIPTION
A	Hartwall cable 8.9.28.51 code 22550
B	White
C	Power cable 8.9.28.12 code 22551
D	Serial transmission cable code 22555
F	Dosing
G	Short circuit JP1
H	Never place the lever in the PROG position
I	Interface
N	Black
R	Red
V	Green
33 - 34	Enabling

3.8 Sibilla 2005 / Gloria - PLUS 1-2 type machine electrical diagram (NEW version)



REF.	DESCRIPTION
A	Hartwall cable 8.9.28.51 code 22550
B	White
C	Power cable 8.9.28.12 code 22551
D	Serial transmission cable code 22555
F	Dosing
G	Short circuit JP1
H	Never place the lever in the PROG position
I	Interface
N	Black
R	Red
V	Green
33 - 34	Enabling

3.9 Gloria - PLUS 3 type machine electrical diagram with Cappuccino and/or Autosteamer



REF.	DESCRIPTION
IN	Interface 32-relay code 26016
CE	Electronic unit PLUS 3 code 18090051-18090052
CA	Power cable 8.9.28.12 code 22551
CH	Hartwall cable 8.9.28.51 code 22554004
CS	Serial transmission cable code 22555
IC1	Microprocessor date 08/04/05 or subsequent
G	Short circuit JP1
IP	Programming switch : never place the lever in the PROG position
B	White
N	Black
R	Red
V	Green
33 - 35	Enabling

DOSE	GROUP	RELAY	REF. CONNECTOR I/O
1 Espresso	1	1	CN7-1
1 Strong	1	2	CN7-2
1 Weak	1	3	CN7-3
2 Espresso	1	4	CN7-4
2 Strong	1	5	CN7-5
2 Weak	1	6	CN7-6
1 Espresso	2	7	CN7-7
1 Strong	2	8	CN7-8
1 Weak	2	9	CN7-9
2 Espresso	2	10	CN7-10
2 Strong	2	11	CN7-11
2 Weak	2	12	CN7-12

DOSE	GROUP	RELAY	REF. CONNECTOR I/O
1 Espresso	3	13	CN7-13
1 Strong	3	14	CN7-14
1 Weak	3	15	CN7-15
2 Espresso	3	16	CN7-16
2 Strong	3	17	CN7-17
2 Weak	3	18	CN7-18
1 Espresso / Cappuccino	4	19	CN7-19
1 Strong / Milk and coffee	4	20	CN7-20
1 Weak / Foamed Milk	4	21	CN7-21
2 Espresso / Warm Milk	4	22	CN7-22
2 Strong / Milk with shot coffee	4	23	CN7-23
2 Weak	4	24	CN7-24

DOSE	RELAY	REF. CONNECTOR I/O
Tea 1	25	CN7-25
Tea 2	26	CN7-26
		CN7-33 enabling I/O
		CN7-35 enabling I/O
		CN7-37 com. relay
		CN7-38 com. relay
		CN7-39 com. relay
		CN7-40 com. relay

Via dei Colli, 66 - 31058 SUSEGANA (TV) - ITALY - Tel. +39.0438.6615 - Fax +39.0438.60657 - www.cmaspa.com - cma@cmaspa.com

ESPRESSO COFFEE MACHINE

USE AND MAINTENANCE MANUAL

Instructions for the technician

SERVINGS COUNT

ENGLISH

Review

Rev 02 - 01/2005 - General review

Rev 03 - 05/2005 - Cancel reference JP1 in INTERNAL selections count with DISPLAY

Summary

1. EXTERNAL servings count

1.1 INTRODUCTION

This is a device which makes it possible to handle simplified accounting of coffee with a coded key. The apparatus consists of a single electronic card on which are mounted the power supply unit, the microprocessor and related peripherals, the display and the components for the management of inputs and outputs. A membrane keypad with 4 built-in keys makes it possible to use the various resources. The information is shown on a 5-digit display. A TH type cover is included to contain the apparatus. The system is automatically power-supplied (230Vca , 115Vca 50/60Hz). The serial interface is compatible with the *3dx series* and *ETx series* doses and along with the normal microprocessor doses enabled for the serial transmission interface. A non-volatile memory in the card is able to store the required data, even in the event of a power outage.

1.2 USER INTERFACE

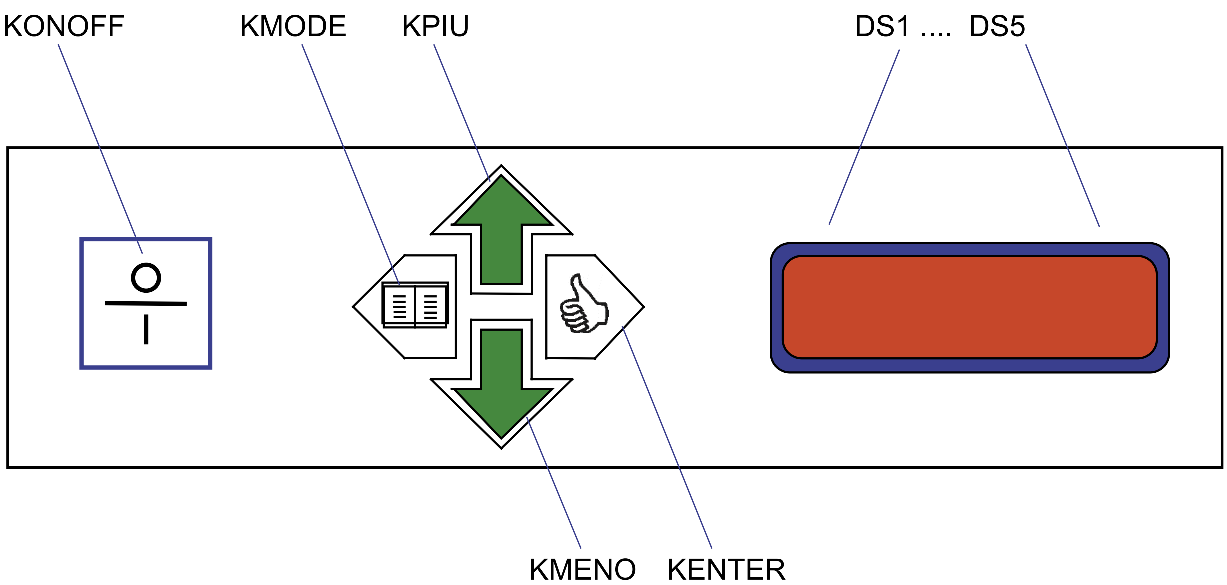
KEYS

- KONOFF Key not used
- KMODE Option selection key
- KENTER Confirm key
- KPIU Value increase key
- KMENO Value decrease key

DISPLAY

DS1, DS2, DS3, DS4, DS5 5 display 7 red segments

Example of silk-screen printed membrane:



The symbols, the colours used, and the position of the parts may vary depending on the model.

1.3 INPUTS/OUTPUTS

ANALOGUE INPUTS

- TEMP Input not available

DIGITAL INPUTS

- CVOL Input not available
- KEY1 Key input not available
- KEY2 Key input not available
- KEY3 Key input not available
- KEY4 Key input not available

SERIAL LINE (RS232)

- TxD / RxD Signals for serial transmission

MAINS VOLTAGE OUTPUTS

- RISC Output not available

POWER SUPPLY

- The card is powered with the nominal mains voltage by means of the appropriate fast-ons

CONNECTIONS

- Power supply FAST-ON (bi-polar plug for countertop version)
- Analogue inputs Included for AMPMODU2
- Digital inputs AMPMODU2
- High voltage outputs Included for FAST-ON
- Serial connection AMPMODU2 (circular connection for countertop version)

1.4 SYSTEM SET-UP: MOBILE JUMPERS

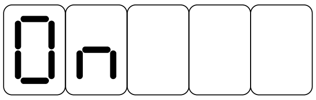
ANALOGUE INPUTS

- P1 Available
- P2 Available

The system configuration jumpers must be set up before the unit is started up.
If the configuration is subsequently modified, the insertion or removal of a jumper must be carried out when the card is not powered. The next start-up will allow the new function to become operational.

1.5 STARTING THE MACHINE

When power is supplied to the device, it comes on and the display shows the message “On”.



In this manner the following functions are enabled:

- Reading of servings performed
- Deletion of servings performed

NOTE

- it is not possible to shut off the device; the KONOFF key, even if connected, is bypassed.
- when power is supplied to the card, for approximately 2 seconds the version of the installed program is shown. E.g.: “V.1.00”.

1.6 READING AND DELETION FUNCTIONS

The reading and deletion functions are permitted only with the activation key inserted.
To choose the operation to be performed, the KMODE key is used.
By pressing it several times, the available functions are selected one at a time, in the following order:

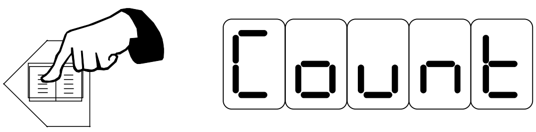
- Reading of servings performed
- Deletion of servings performed

During any data reading or deletion operation, it is not possible to perform dispensing.
“Insertion of the programming key” is understood to mean closure of the relative contact.

1.7 SERVING READING (STROKE COUNT)

The number of SERVINGS provided by each single key of each group of connected dosing can be viewed by means of the following procedure:

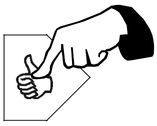
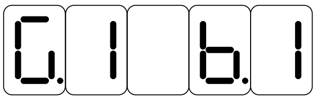
- Insert the activation key.
- Press the KMODE key, and the display will show the message “Count”.



- Then, within 30 seconds, press the KENTER key.

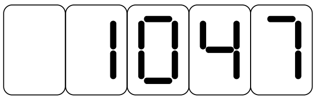
The first item of data is shown, which consists of the number of SERVINGS made on the first key of the first group.

The first item of data is shown, which consists of the number of SERVINGS made on the first key of the first group. Or the display shows:

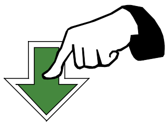



(Group 1, button 1)

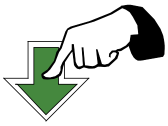
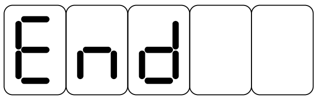
and the number of SERVINGS performed. Example:



- Using the keys KPIU and KMENO it is possible to read the servings provided by the other keys of all of the groups.

First all the keys of a group are displayed in order, then you move on to the next group.
During scanning, those keys which were not used to provide any servings are skipped.
By pressing KPIU when reading is in the last position available or by pressing KMENO when reading is in the first position available, the display shows the message “End”.

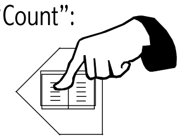
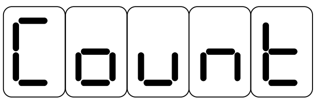




The highest number of servings which can be counted for each key is 65535.
After that number, counting resets to zero.

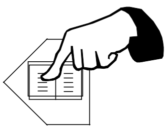
Each dose is counted at its start, including any doses which may have been carried out during dose programming.

- To end the servings reading phase, press the key KMODE.

The display will go back to showing the message “Count”:

- To go back to the normal indication, press KMODE repeatedly:

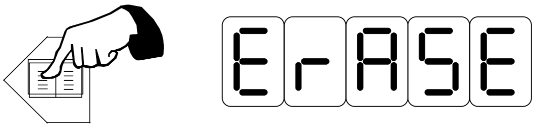


If no key is pressed during reading for 30 seconds, reading is aborted and the machine reverts to the previous status.

1.8 SERVING DELETION (STROKE COUNT)

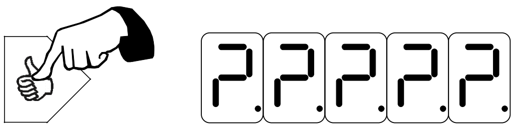
The number of SERVINGS provided by each single key of each group of connected dosing can be deleted in a single operation through the following procedure.

- Insert the activation key.
- Press the KMODE key twice, and the display will show the message “ErASE”:



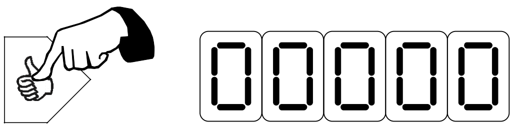
- Then, within 30 seconds, press the KENTER key.

The display will show question marks to ask for confirmation of the action to be performed.



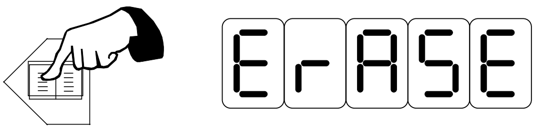
- To confirm data deletion, press KENTER again

The display will show:

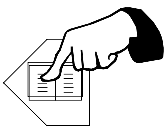


- To terminate the deletion of counted servings phase (even if deletion has not been performed) press the key KMODE.

The display will go back to showing the message “ErASE”:



- To go back to the normal indication, press KMODE.



If no key is pressed during deletion for 30 seconds, reading is aborted and the machine reverts to the previous status.

1.9 SERIAL CONNECTION

The system is able to interface in serial mode with the coffee machine.
Refer to the technical specifications for dosing for their correct configuration.
Connection is made by means of an RS232 serial line, with the appropriate cable.

Serial transmission characteristics:

• BAUD RATE	1200 bit/sec
• DATA LENGTH	8 bit
• PARITY	EVEN
• STOP BIT	2
• CLOCK RATE	64
• VOLTAGE LEVELS	0/+5 Vdc

Operation

A code corresponds to each dosing key. When a serving is requested from a certain key, the dosing device sends the relative code by means of its serial line. If it receives in reply the same code or a code from 1 to 15 (decimal) the serving is delivered, otherwise it is deleted. The codes are typical of the traditional interface with the Gicar Stroke Count, which transmits a code that makes it possible to recognize the staff that is using the machine (1...13 : waiters, 14 : manager, 15 : owner).

List of codes used by dosing:

• 11H	Group 1	Key 1
• 12H	Group 1	Key 2
• 13H	Group 1	Key 3
• 14H	Group 1	Key 4
• 15H	Group 1	Key Tea 1
• 16H	Group 1	Key Tea 2
• 17H	Group 1	Stop/Cont/Prog Key (Dosmask series)
• 19H	Group 1	Stop/Cont/Prog Key (Dosmask series)
• 21H	Group 2	Key 1
• 22H	Group 2	Key 2
• 23H	Group 2	Key 3
• 24H	Group 2	Key 4
• 25H	Group 2	Key available
• 26H	Group 2	Key available
• 27H	Group 2	Stop/Cont/Prog Key (Dosmask series)
• 29H	Group 2	Stop/Cont/Prog Key (Dosmask series)
• 31H	Group 3	Key 1
• 32H	Group 3	Key 2
• 33H	Group 3	Key 3
• 34H	Group 3	Key 4
• 35H	Group 3	Key available
• 36H	Group 3	Key available
• 37H	Group 3	Stop/Cont/Prog Key (Dosmask series)
• 39H	Group 3	Stop/Cont/Prog Key (Dosmask series)
• 41H	Group 4	Key 1
• 42H	Group 4	Key 2
• 43H	Group 4	Key 3
• 44H	Group 4	Key 4
• 45H	Group 4	Key available
• 46H	Group 4	Key available
• 47H	Group 4	Stop/Cont/Prog Key (Dosmask series)
• 49H	Group 4	Stop/Cont/Prog Key (Dosmask series)

The system replies code 15 (decimal), thus enabling delivery of the serving (even if the activation key is inserted).
During any data reading or deletion operation, the system does not reply or replies with a code which is not recognized by the dosing. In this case, delivery is not performed and the serving is not counted.

1.10 PROCEDURE IN CASE OF POWER FAILURE

If there is a power outage, the system will store all data concerning the count of servings delivered.
Since the update of the count takes place at the start of the delivery of the serving, if it is aborted due to a power outage, it is still counted and recognized by the dosing device. In this case, delivery is not performed and the serving is not counted.

1.11 TECHNICAL DATA

GENERAL DATA

• Power supply voltage	200-230Vac or 100-115Vac
• Operating temperature	10-55°C
• Operating humidity	30-85 % RH without condensation
• Transformer	2 VA - clim.categ. T70/E - 4 KVca
• Input - keys	Switch / Pure contact
• Signals for serial transmission	RS232 0-5V

CONNECTIONS for “PANEL” model

• Power supply	FAST - ON
• Analogue inputs	Included for AMPMODU2
• Digital inputs	AMPMODU2
• High voltage outputs	Included for FAST-ON
• Serial connection	AMPMODU2

CONNECTIONS for “COUNTERTOP” model

• Power supply	Bi-polar plug
• Digital inputs	Cable with activation keys inside the case
• Serial connection	5-way circular connection

1.12 INSTRUCTIONS FOR INSTALLATION AND LIMITATIONS OF USE

WIRING

Wiring of the cards must be laid out in consideration of the need to separate low voltage from high voltage connections.
The length of any cable must be as short as possible to allow correct connection.
If necessary, screened cables must be used.
The unit must also be located far from devices which may create electromagnetic disturbances when in operation, such as pumps, solenoid valves, remote switches, motors in general, and neon lights.

SURROUNDINGS

The unit must be placed as far as possible from potential heat sources and excessive humidity and from places where, for any reason, condensation may form.

SOILING

Inside the machine, the card must be suitably protected against soiling.
By definition, “in general, the inside of a unit having a case which sufficiently protects it from dust is considered to be protected against soiling” (EN 60335-1).

MESH FILTER
In order to meet the standards of directives concerning electromagnetic compatibility, it may be necessary to provide the machine with a mesh filter outside the card.
In this case, its installation requires compliance with a few basic rules:
- the filter (if of a type with a metallic body) must be installed on the metal frame of the unit, with an electrical path of low impedance towards earth.
- It must be installed as near as possible to the entry point of the of the power cable, with short input and output connections that are set well apart from each other, to avoid disturbances between the mains, loads and the unit.

If the filter is not installed in compliance these instructions, it may lose all or part of its effectiveness.

PERFORMANCE
Best performance of the card is obtained at an ambient temperature of roughly 25°C.
For higher or lower temperatures, precision and heat dissipation results tend to worsen.
However, the temperature range as defined in the electrical characteristics is adhered to.
To avoid permanent damage to some components, remain within the range 0...70°C.

1.13 WARNINGS

DANGER
The unit contains parts with a high voltage power supply.
Before performing any work, disconnect the unit from the electrical mains.

START-UP
Before providing power to the unit, make all required connections.

PROTECTION
Ensure that all accessible metal parts which may receive live current due to an insulation defect are permanently and securely attached to the earth terminal of the machine.
Ensure that the earth terminal of the machine is connected to an efficient earth protection

EXTERNAL COMPONENTS
The insertion of components outside the card which are required to ensure suitable reduction of disturbances must not compromise the safety of the unit. This means that they must be of a suitable type and value.

COMPONENTS
If necessary, we reserve the right to replace the components used with other devices produced by other manufacturers but with the same electrical and regulatory characteristics.

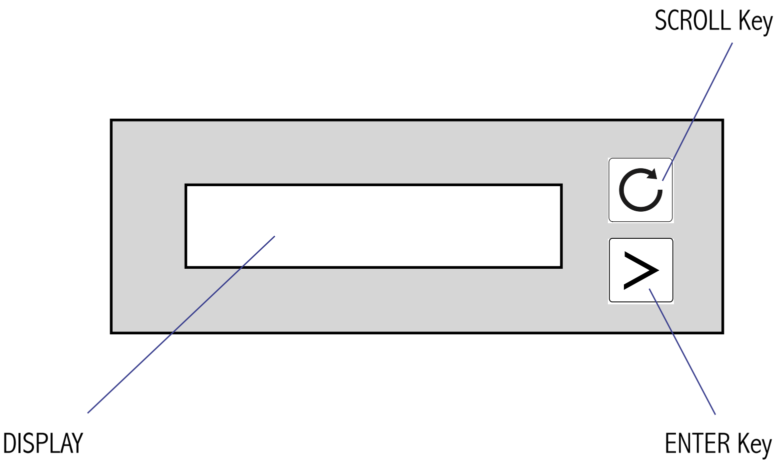
SOFTWARE
If necessary, we reserve the right to make partial corrections to the described procedures during the software development stage, to allow easier or more effective use of the machine or a more coherent development of software, without modifying the functional aspects of the machine.

SAFETY
Protection against electrical shock, fire hazard, mechanical risks or hazardous malfunctions in other parts of the machine does not depend on correct operation of the electronic circuit.
Therefore, where necessary, the machine must be equipped with safety devices which are independent of the electronic circuit (e.g. pressure overload safety valve).

2. INTERNAL selection counter with DISPLAY

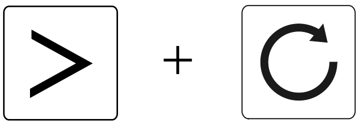
2.1 GENERAL DESCRIPTION 12

The selection counter is powered (12V) and receives data by means of a 4-pole serial cable connected directly to the central dosing control unit. Data is shown on an LCD, 2 lines x 16 characters (see figure). With the SCROLL and ENTER buttons of the membrane push button panel, it is possible to read, insert and delete data.



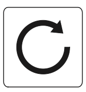
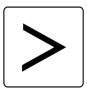
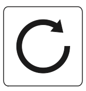
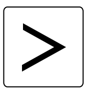
2.2 START-UP

The display comes on automatically when the machine is started up. After a few seconds, the time appears flashing. The time can be adjusted within 5 seconds of start-up, while it is flashing. To enter time setting mode, press the buttons SCROLL and ENTER at the same time.



2.3 SETTING THE TIME

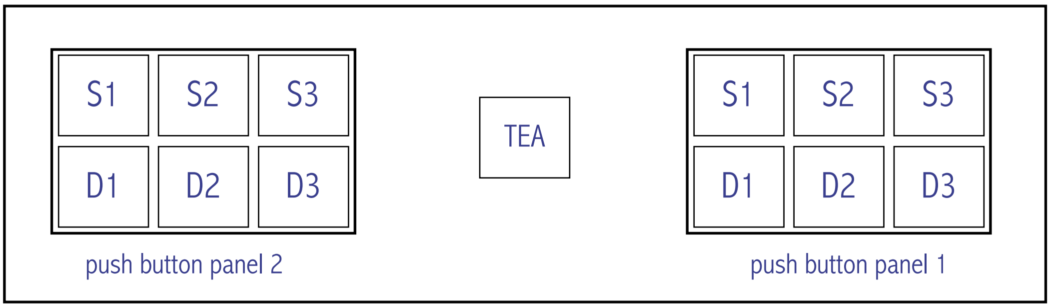
The time is set in the following way:

- SCROLL button  + ENTER button  → change from HOURS to MINUTES; set hour value
- SCROLL button  → INCREASE HOURS or MINUTES value
- ENTER button  → INCREASE HOURS or MINUTES value

2.4 COUNTING MODE

ATTENTION: for the serving counter to work, the key switch must be in the OFF position (in this situation the semi-automatic push button is disengaged and delivery is permitted only by means of the electronic push button panels).
The key selector is located on the front panel of the taps on the right-hand side.

The selection counter counts the strokes of each key of the push button panel. It also totals and displays the strokes of all the keys of the push button panels. The codes of the keys are shown in the following figure:



- **S** single dose
- **D** double dose
- **1** small dose
- **2** medium dose
- **3** large dose

The display independently counts the doses delivered for each type of key. The counts which are enabled for machines with 2 groups (for 3 groups it is the same) are shown in the following table.

N.B. For the double dose push buttons, the selection counter automatically counts two doses each time the key is pressed. This is true both for the register for single doses and for the total count of all doses.

PUSH BUTTON PANEL	KEY	DISPLAY MESSAGE	DOSES COUNTED FOR EACH PRESS
1	S1	Group 1 coffee 1	1
1	D1	Group 1 coffee 2	2
1	S2	Group 1 coffee 3	1
1	D2	Group 1 coffee 4	2
1	S2	Group 1 coffee 5	1
1	D2	Group 1 coffee 6	2
2	S1	Group 2 coffee 1	1
2	D1	Group 2 coffee 2	2
2	S2	Group 2 coffee 3	1
2	D2	Group 2 coffee 4	2
2	S2	Group 2 coffee 5	1
2	D2	Group 2 coffee 6	2
---	Tea push button	Tea 1	1
---	---	Tea 2	disabled
---	---	Total count	Sum of all coffee doses delivered by all push buttons of all push button panels $\sum$push button panel 1 + $\sum$push button panel 2

NOTE
The operation illustrated above is also valid for machines with 3 or 4 groups. In this case, to arrange for the 3- or 4-group versions, it is necessary to intervene inside the selection counter, closing the jumper.

2.5 MALFUNCTION

If the selection does not work, turn the key switch to the ON position. In this way, semi-automatic manual coffee delivery is activated by means of the manual push button of group 2. This is also true of the machines with 3 groups: only the left-hand group of the machine is activated.

2.6 PROGRAMMING MODE

To enter programming, it is necessary to open the box of the dosing card and remove the jumper that closes the contact on JP1. After that, the procedure is the usual one. An example follows:

1) Turn the key selector to the ON position;
2) Press key 5 on the right-hand push button panel for at least 5 seconds. All the LED of the push buttons will come on at the same time, and this is the signal that you have accessed programming.
3) Program the desired coffee or tea dose by pressing the corresponding key on the push button panel or the tea push button. When the desired amount has been reached, push the same button again.
4) When the programming phase is complete, turn the key selector to the OFF position.

2.7 RESETTING

The data memorized by the selection counter can be reset. Each register can be reset independently of the others. This is also true of the register for the total doses which can be reset while the register for the single keys retains the inserted data.

To reset the selections, the main key switch must be in the ON position (see figure).



Procedure:

1) Turn the key selector to the ON position
2) Press the SCROLL and ENTER keys at the same time
3) Select data with the SCROLL key until the register you want to reset appears
4) Press the ENTER key: the display will show the message “RESET ????”
5) To reset hold down the ENTER key and press SCROLL. The register will be reset while the other data remains unchanged

2.8 SUMMARY

- key selector on OFF ⟶ counting
- key selector on ON ⟶ manual delivery permitted on 1 group / programming mode
- key selector on ON + SCROLL + ENTER ⟶ reset mode
- internal jumper to display closed ⟶ activation for machines with 3 or 4 groups

ESPRESSO COFFEE MACHINE

USE AND MAINTENANCE MANUAL

Instructions for the technician

CREDIT-DEBIT system

ENGLISH

Via dei Colli, 66 - 31058 SUSEGANA (TV) - ITALY - Tel. +39.0438.6615 - Fax +39.0438.60657 - www.cmaspa.com - cma@cmaspa.com

Summary

1. GLORIA Credit-Debit

1.1 Installation

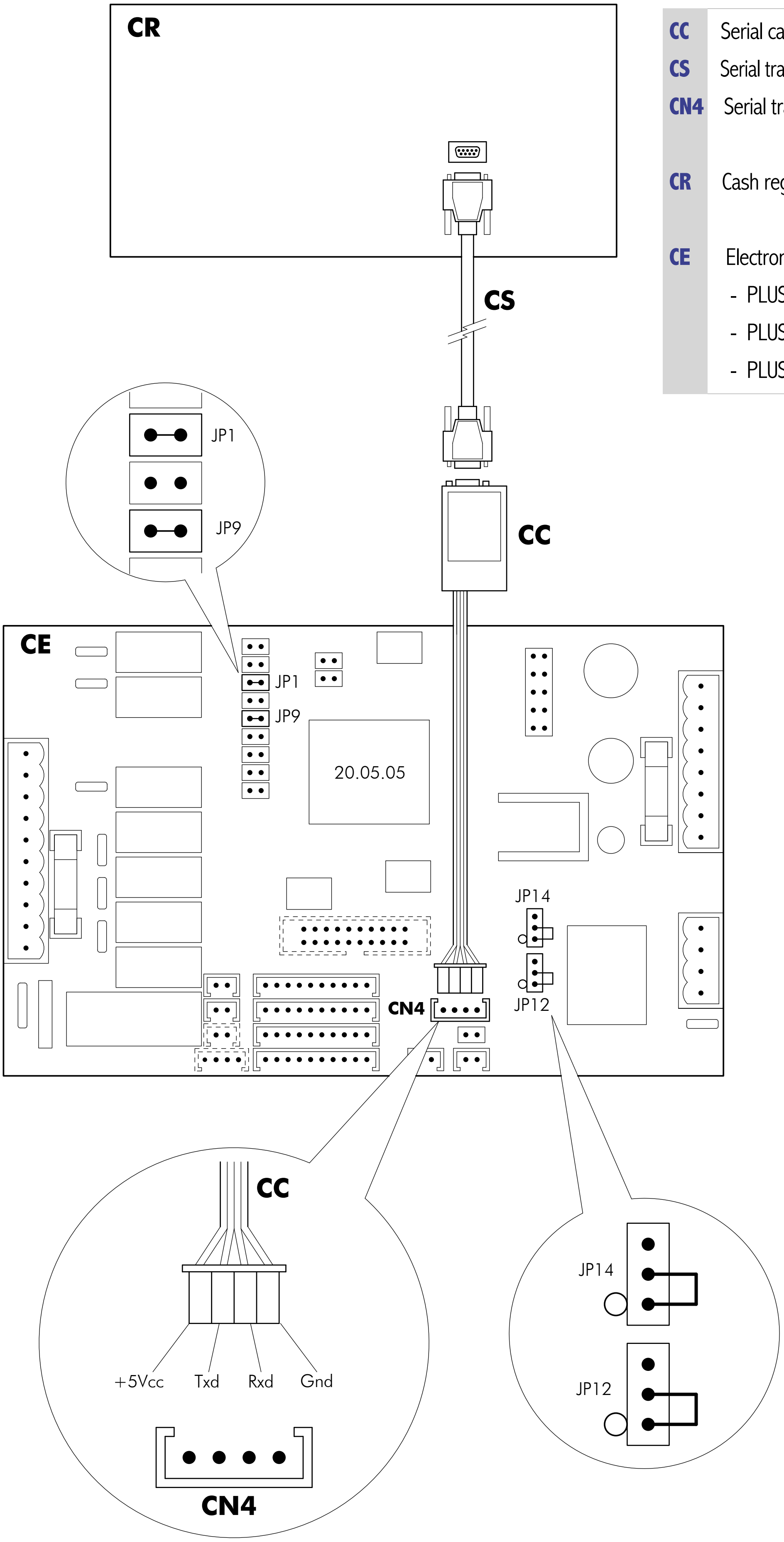
The CREDIT-DEBIT is active in the PLUS1 electronic control units with the code 18090047-18090048 (without display), PLUS2 with code 18090037-18090038 (with display) and PLUS3 with code 18090051-18090052 (model with cappuccino /autosteamer) with software program dated **20/05/05** or later.
For installation proceed as follows:

- Turn the machine off;
- activate mobile jumpers **JP1** and **JP9** as shown in the electrical diagram;
- activate jumpers **JP12** and **JP14** as shown in the electrical diagram;
- connect the provided cable **CC** (code 22556003) to the dedicated connector **CN4** of the control unit;
- by means of a standard serial cable **CS**, connect the other end of cable **CC** to the cash register;
- start the machine again.

NOTE
The cash register management software and the standard serial cable **CS** *(maximum length 15 metres) are not the responsibility of the manufacturer.*

WARNING
In machines with a software program dated ***23/06/04*** *or earlier, the control unit must be replaced.*

Programming of doses can be performed without having to disconnect the Credit-Debit device.
If the cash register is enabled, programmed doses are counted. To prevent counting, de-activate jumper JP1 prior to programming.



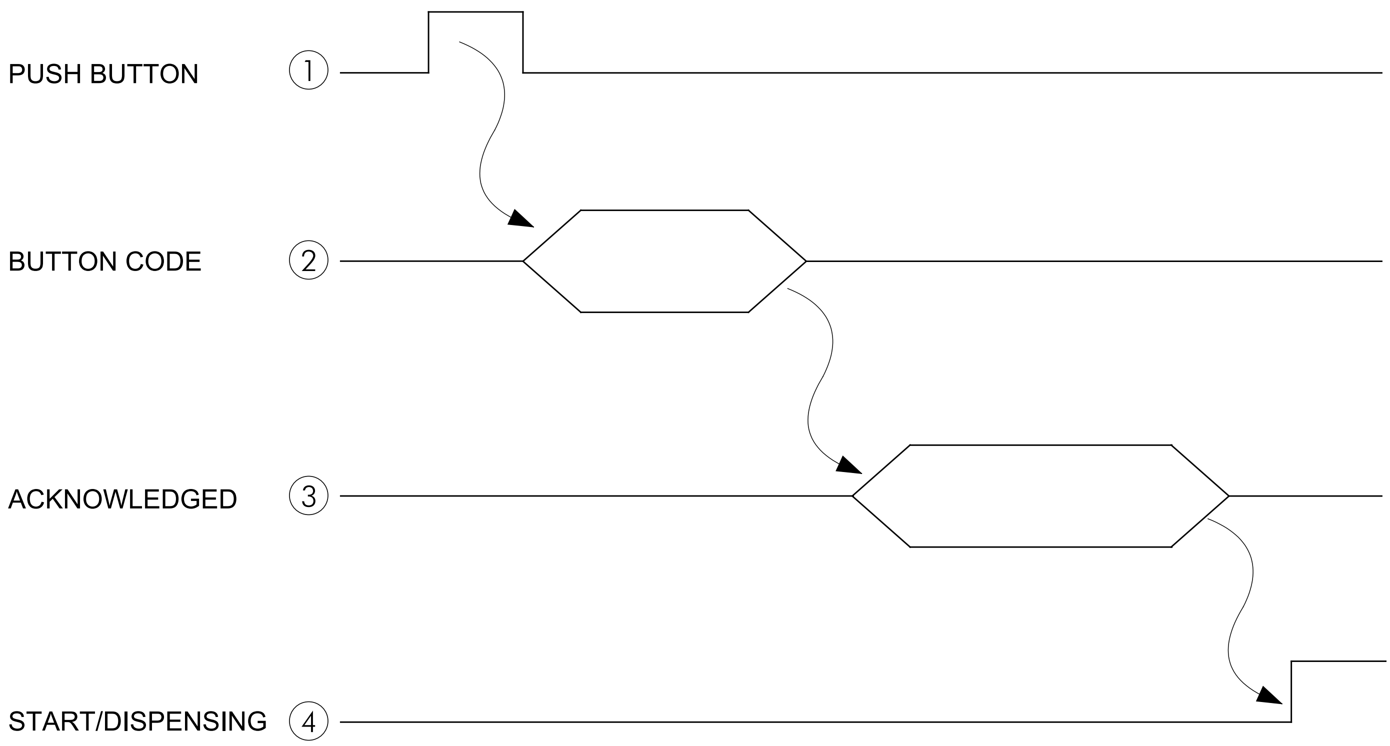
CC	Serial cable code 22556003 included
CS	Serial transmission cable (max. 15 mt) not included
CN4	Serial transmission connector
CR	Cash register
CE	Electronic control unit - PLUS1 code 18090047-48 - PLUS2 code 18090037-38 - PLUS3 code 18090051-52

1.2 Communication protocol

Description of the operating principle with reference to the diagram shown below:

- request the beverage at the cash register;
- select the reserved serving on the coffee machine;
- the code that corresponds to the selection is sent to the cash register (see table of codes);
- the cash register replies **ACK=06H** thus enabling dispensing;
- the coffee machine dispenses the beverage.

If the cash register does not identify the code, there is no enabling and the selection is not served, and the cash register sends **NACK=15H**



Baud rate: 1200, 8 bit + 1 bit Stop. Parity N (none)

1.3 Table of codes

DESCRIPTION	SIGNAL	RELAY	REF. I/O CONNECTOR
1 Espresso GR1	011 h	1	CN7-1
1 Medium GR1	012 h	2	CN7-2
1 Long GR1	013 h	3	CN7-3
2 Espressos GR1	014 h	4	CN7-4
2 Medium GR1	015 h	5	CN7-5
2 Long GR1	016 h	6	CN7-6
1 Espresso GR2	021 h	7	CN7-7
1 Medium GR2	022 h	8	CN7-8
1 Long GR2	023 h	9	CN7-9
2 Espressos GR2	024 h	10	CN7-10
2 Medium GR2	025 h	11	CN7-11
2 Long GR2	026 h	12	CN7-12
1 Espresso GR3	031 h	13	CN7-13
1 Medium GR3	032 h	14	CN7-14
1 Long GR3	033 h	15	CN7-15
2 Espressos GR3	034 h	16	CN7-16
2 Medium GR3	035 h	17	CN7-17
2 Long GR3	036 h	18	CN7-18
1 Espresso GR4 / Cappuccino	041 h	19	CN7-19
1 Medium GR4 / Café Latte	042 h	20	CN7-20
1 Long GR4 / Foamed milk	043 h	21	CN7-21
2 Espressos GR4 / Warm milk	044 h	22	CN7-22
2 Medium GR4	045 h	23	CN7-23
2 Long GR4 / Milk with shot of coffee	046 h	24	CN7-24
Tea 1	051 h	25	CN7-25
Tea 2	052 h	26	CN7-26
			CN7-33 I/O enable
			CN7-35 I/O enable
			CN7-37 com. relay
			CN7-38 com. relay

ESPRESSO COFFEE MACHINE

USE AND MAINTENANCE MANUAL

Instructions for the technician

MACHINE DIAGRAMS

ENGLISH

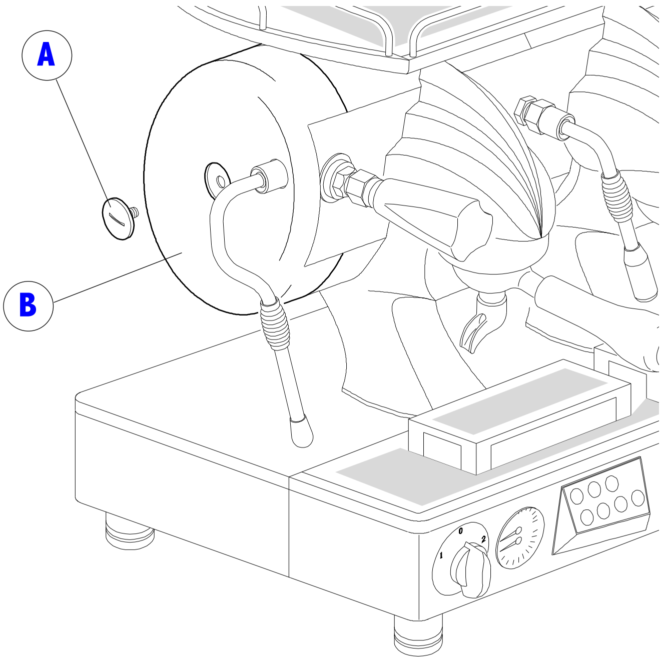
Via dei Colli, 66 - 31058 SUSEGANA (TV) - ITALY - Tel. +39.0438.6615 - Fax +39.0438.60657 - www.cmaspa.com - cma@cmaspa.com

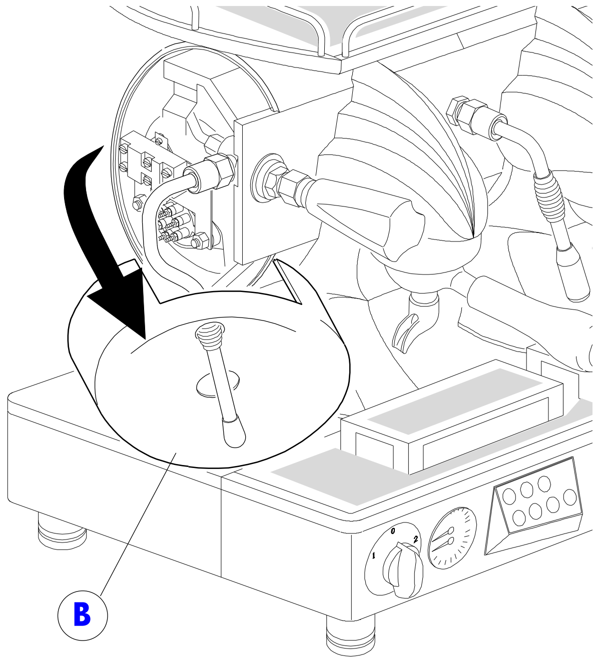
Summary

1 SIBILLA machine

1.1 REPLACEMENT of the HEATING ELEMENT or of the HEATING ELEMENT PROTECTION

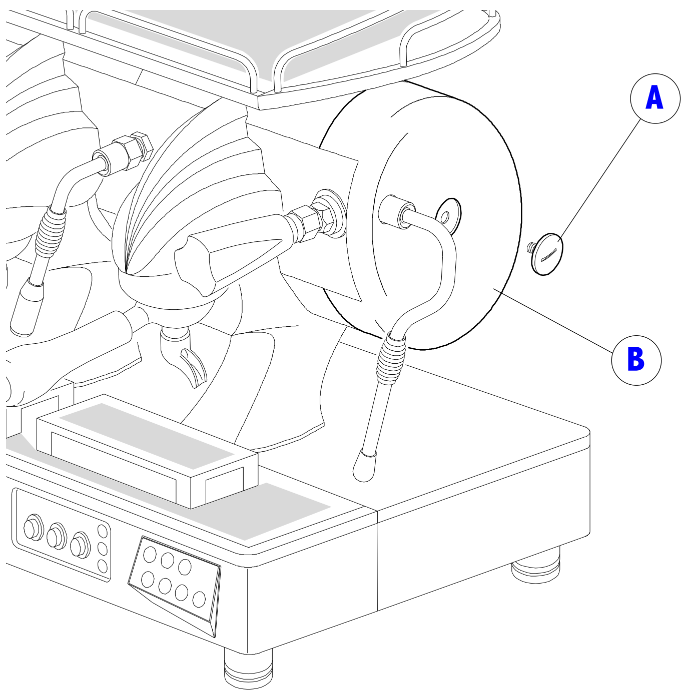
1) Completely loosen the screw (A) located on the left-hand side of the body (B)
2) Remove the left hand side of the body (B) following the profile of the steam nozzle
3) After working on the heating element or heating element protection, put the body panel (B) back in place and tighten the screw (A)

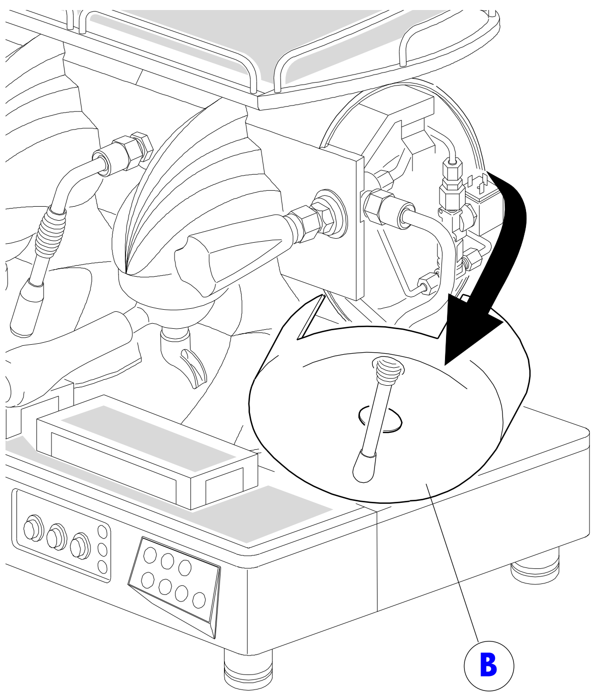




1.2 REPLACEMENT of the HOT WATER SOLENOID VALVE

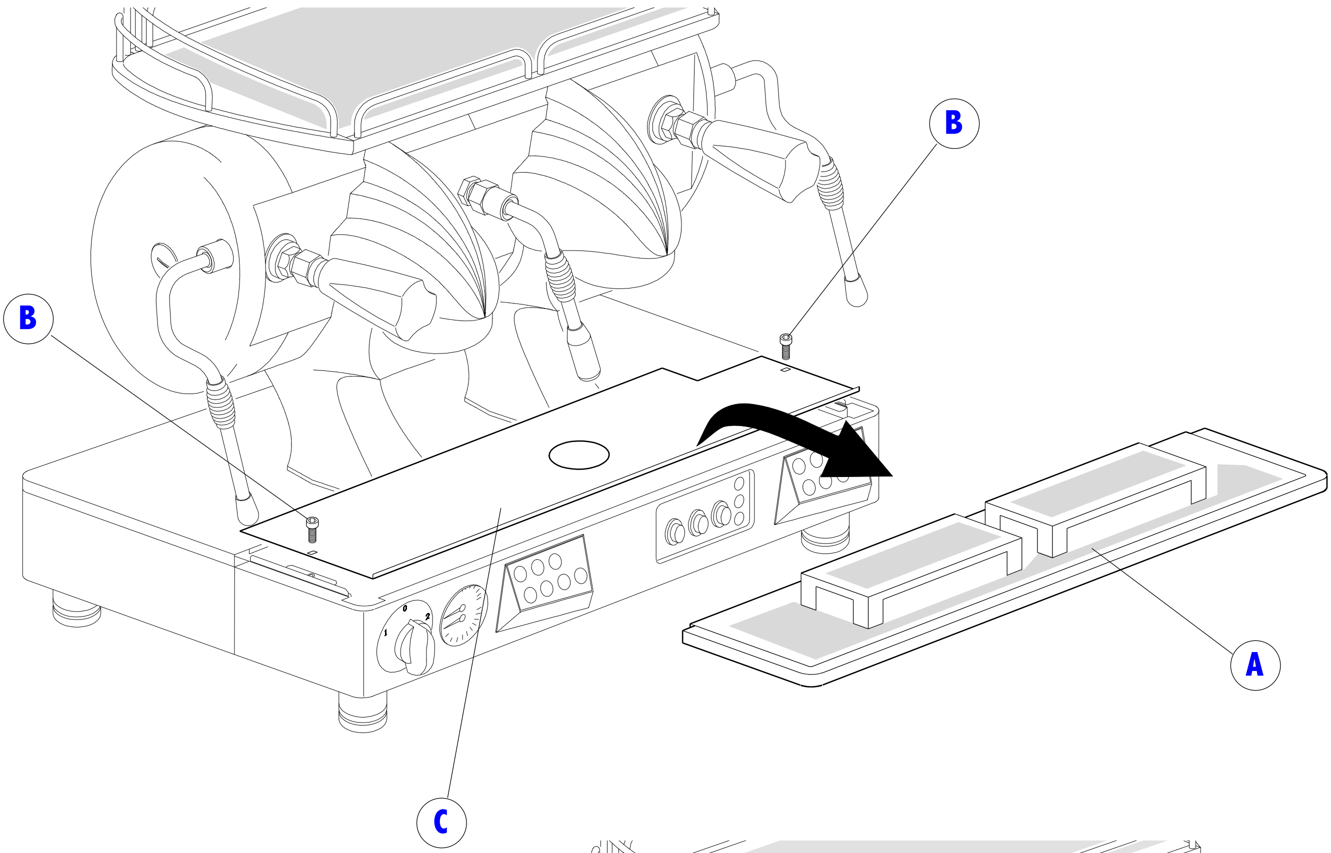
1) Completely loosen the screw (A) located on the right-hand side of the body (B)
2) Remove the right-hand side of the body (B) following the profile of the steam nozzle
3) After working on the solenoid valve, put the body panel (B) back in place and tighten the screw (A)

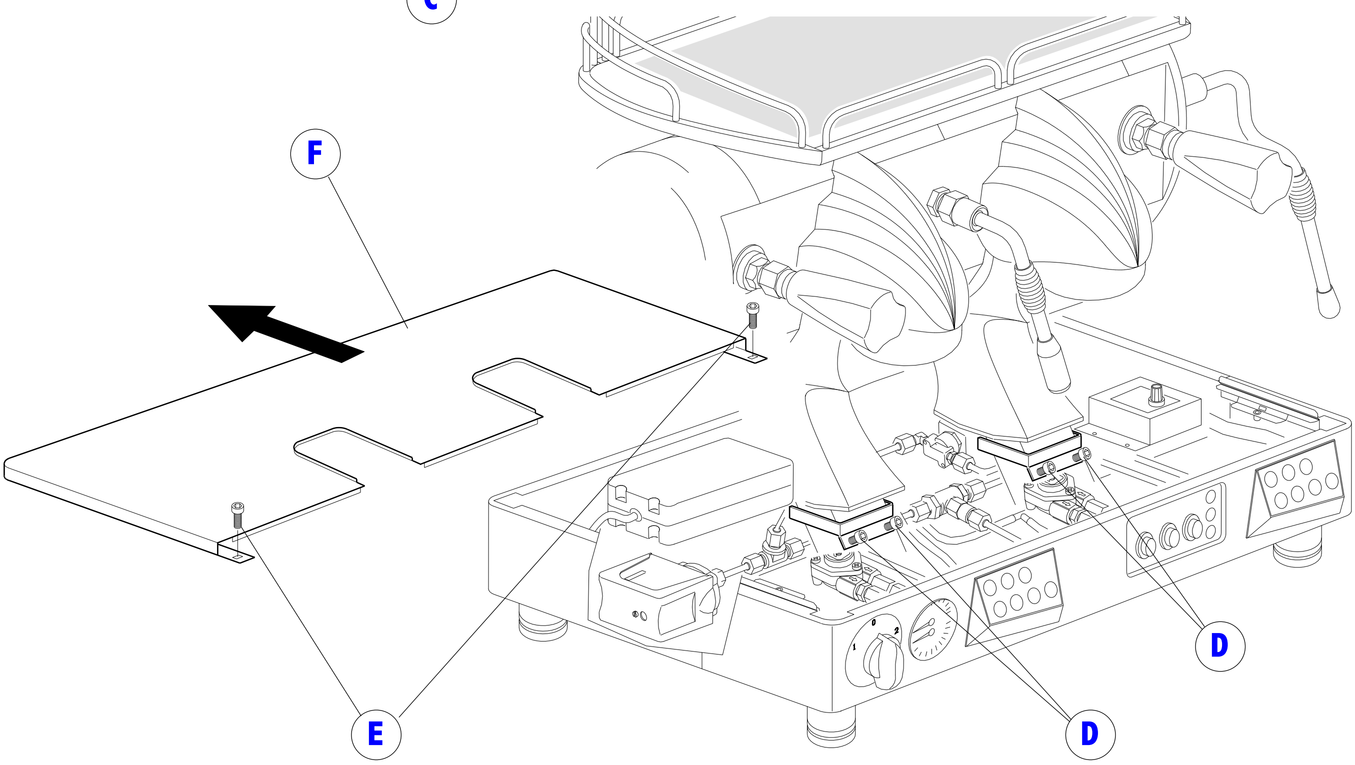




1.3 WORKING on the CONTROL UNIT, PRESSURE SWITCH, DOSING DEVICES, or CUP HEATER THERMOSTAT

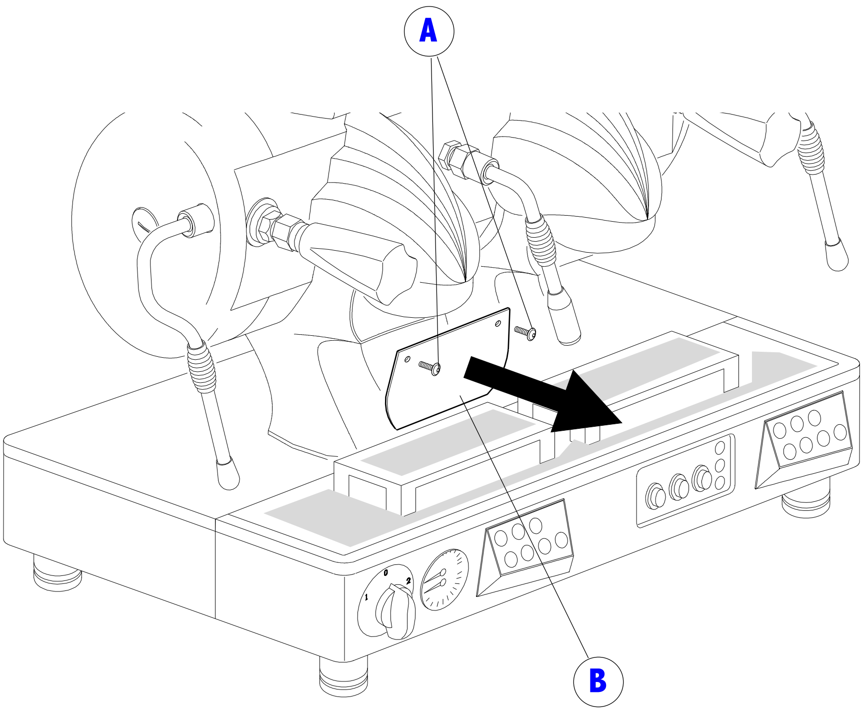
1) Remove the lower grilles and the drain tub (A)
2) Loosen the screws (B) and remove the protection (C)
3) Loosen the screws (D) located on the base of the support covers of the boiler
4) Loosen the screws (E) and remove the rear cover of the base (F) by sliding it outwards
5) After work is complete, put the body components back in place by following the procedure in reverse order

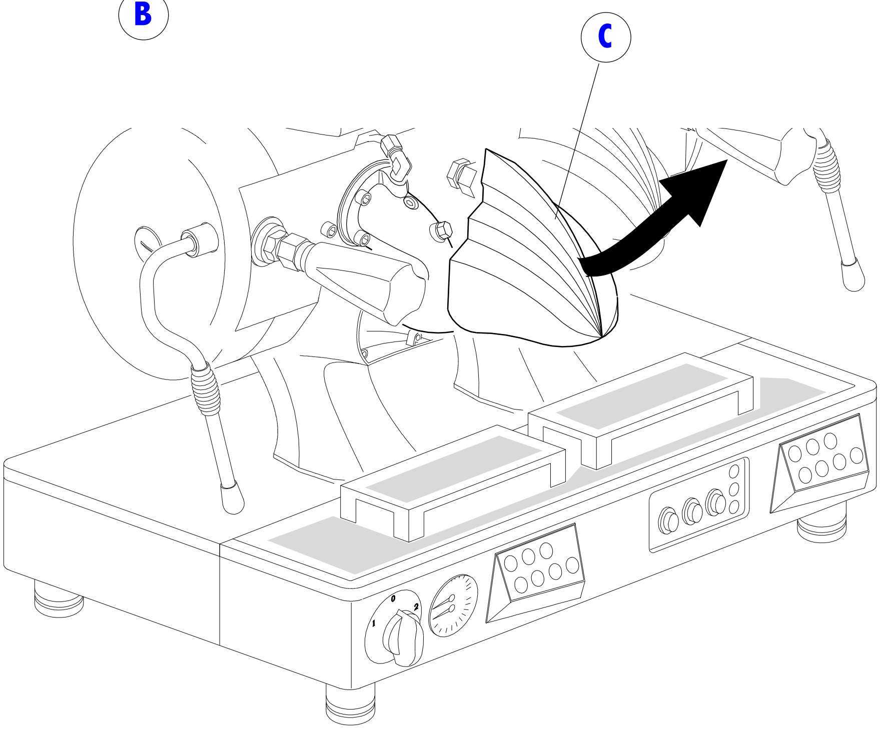


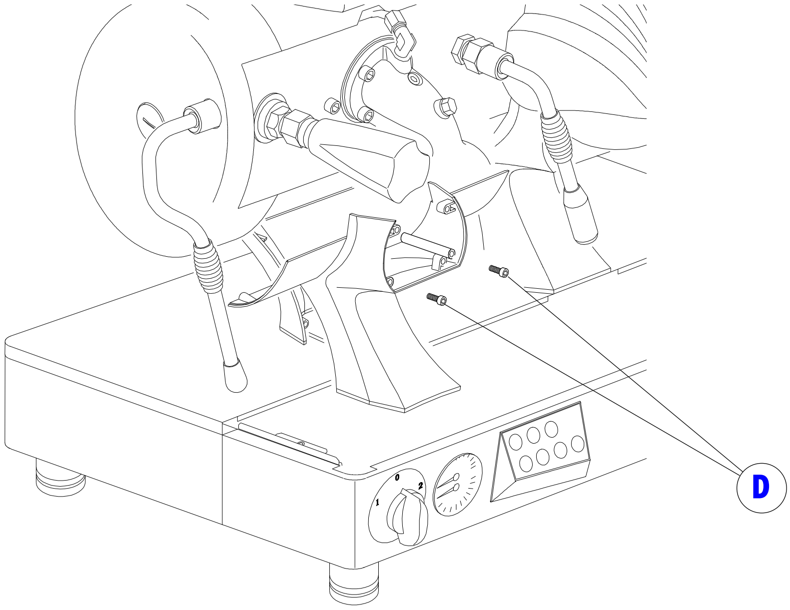


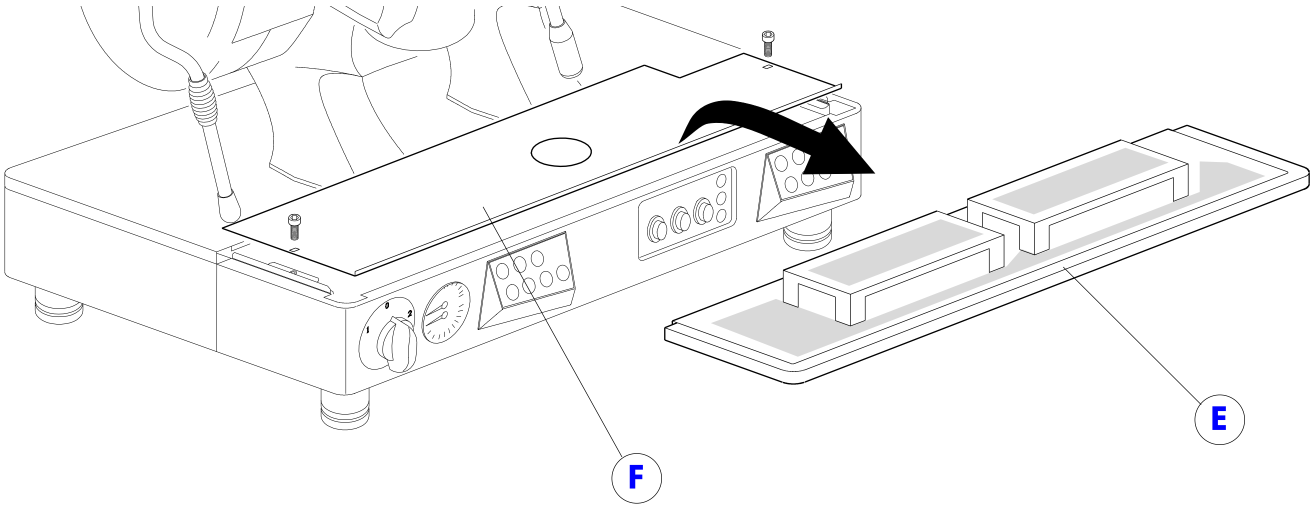
1.4 WORKING on the DELIVERY GROUP or ITS COMPONENTS

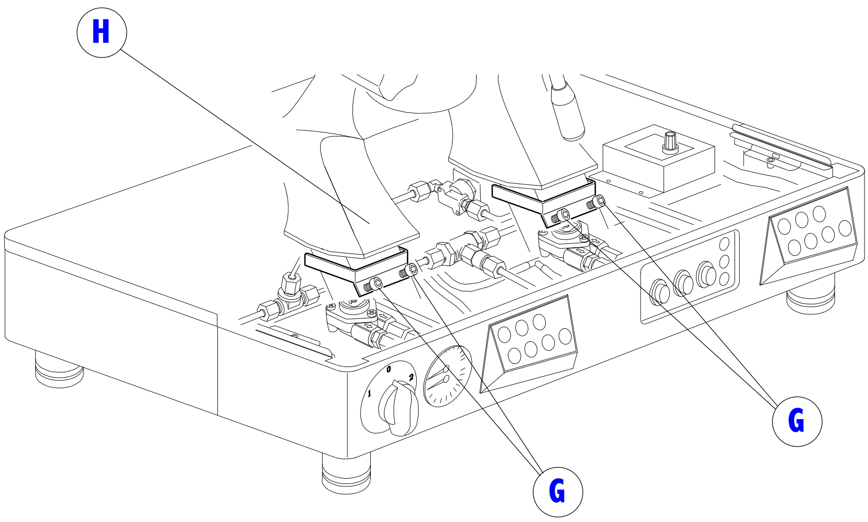
1) Use a 3 mm hex wrench to loosen the fastening screws (A) and remove the stainless steel plaque (B) located under the attachment ring of the delivery group
2) Remove the protection cap of the delivery group (C)
3) Loosen the screws (D) housed inside the holes
4) Remove the lower grilles and the drain tub (E)
5) Loosen the screws and remove the protection (F)
6) Loosen the screws (G) located on the base of the support covers of the boiler
7) Remove the front part of the support cover of the boiler by pulling it toward you (H)
8) After work is complete, put the body components back in place by following the procedure in reverse order





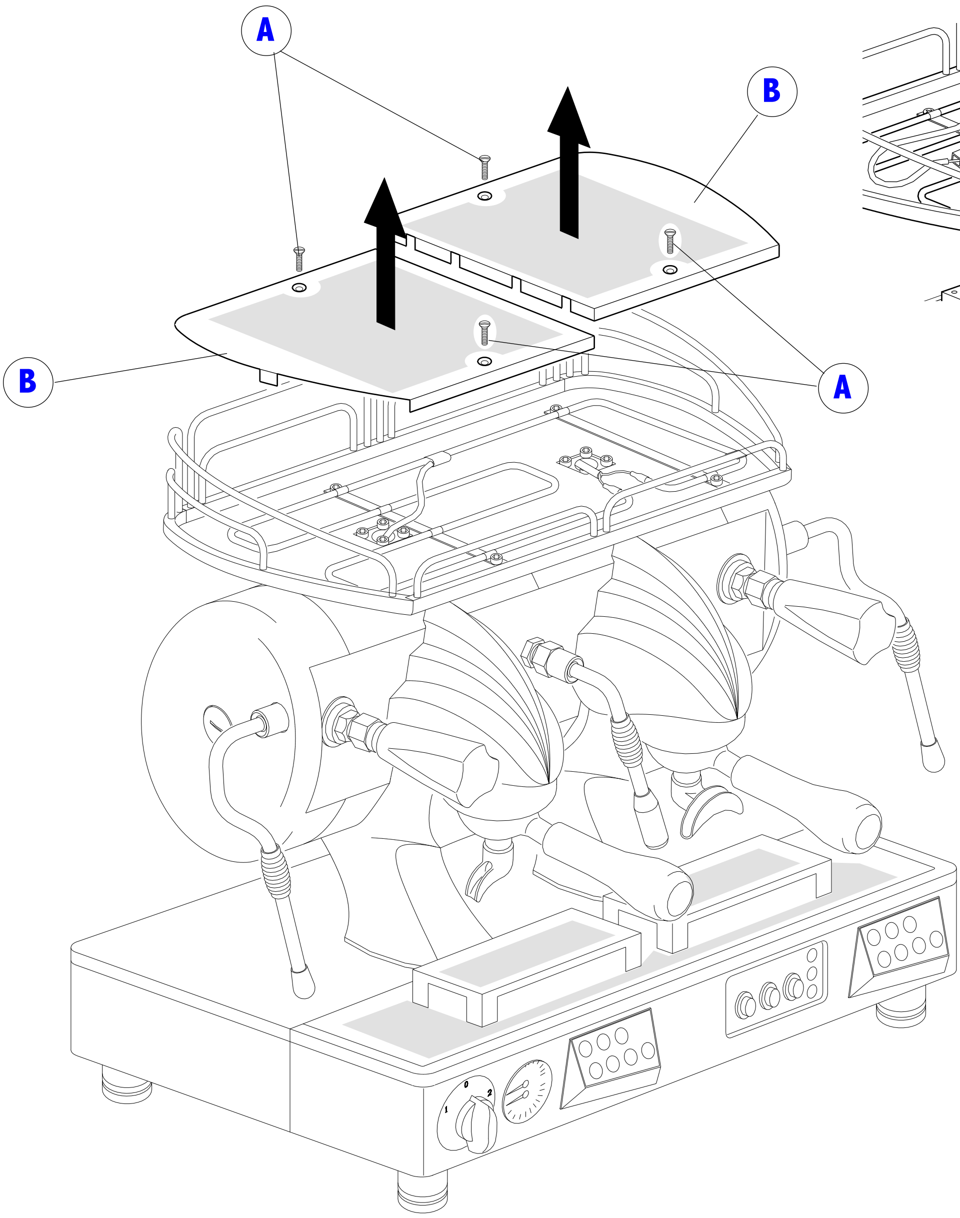

D

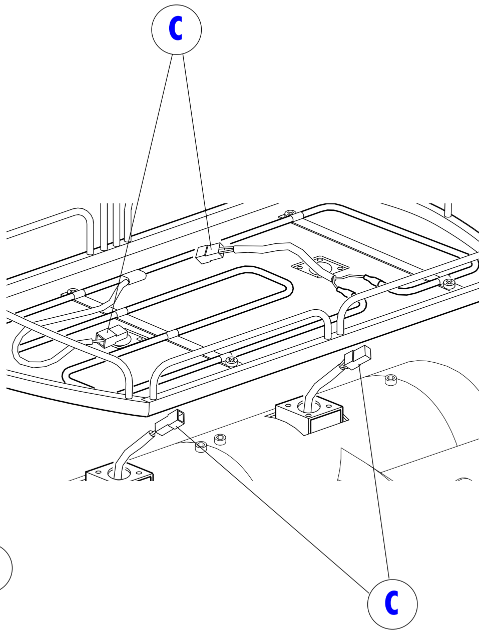

E
F


H
G
G

1.5 REPLACEMENT of the HEATING ELEMENT of the CUP HEATER

1) Loosen the fastening screws located on the cup holder grille (A)
2) Remove the cup holder grilles (B)
3) To remove the heating element it is first necessary to disconnect the electrical connectors (C) for the heating element and temperature probe which are located in the cup heater compartment
4) After working on the heating element, put the grilles (B) back in place and tighten the screws (A)

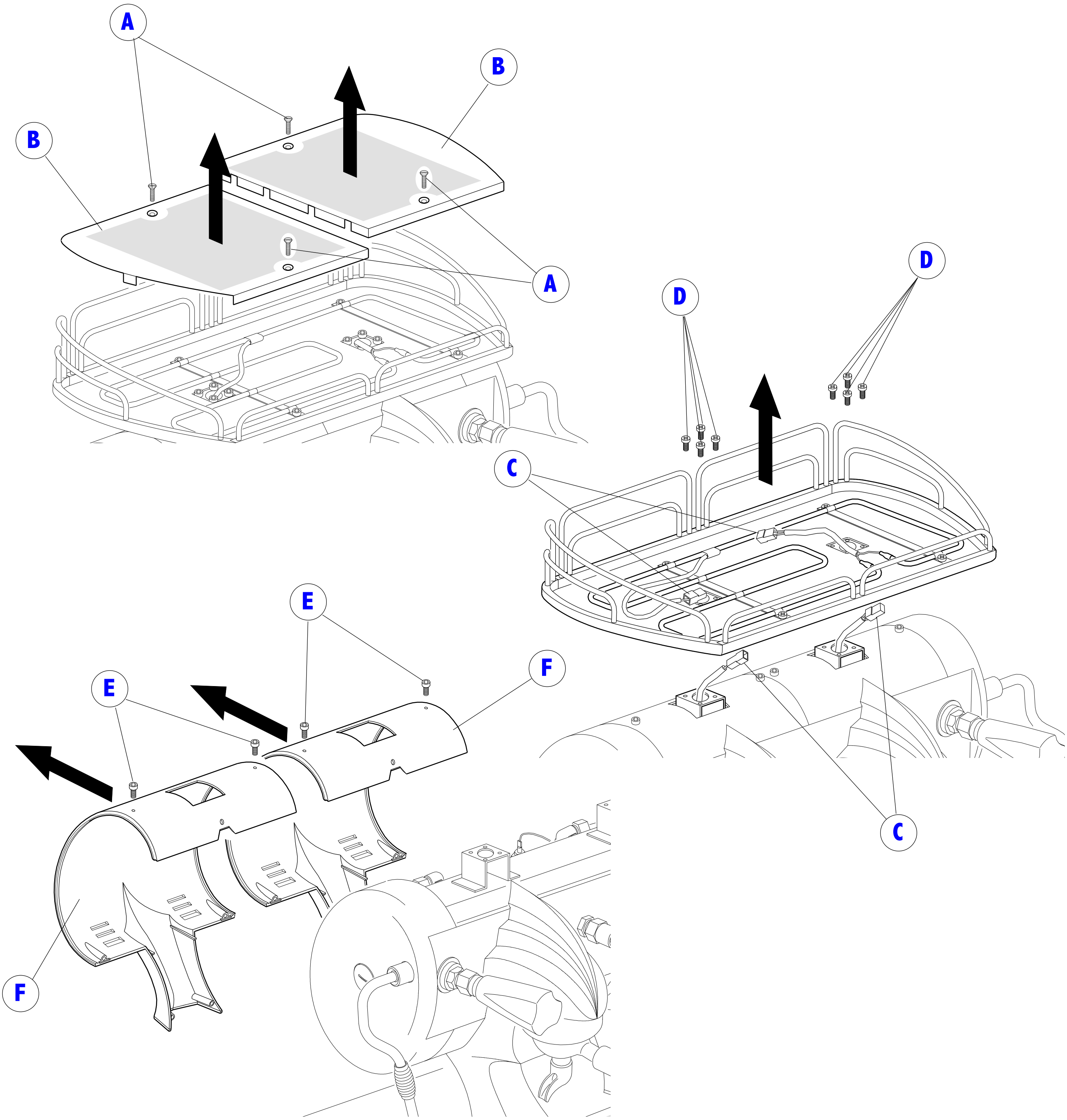




WARNING
Any work on the machine must be performed with the machine disconnected from the electrical and hydraulic mains and with the boiler cold.

1.6 WORKING on the UPPER PART OF THE BOILER (safety valve, expansion valve, etc.)

1) Loosen the fastening screws located on the cup holder grille (A)
2) Remove the cup holder grilles (B)
3) Disconnect the electrical connectors (C) for the heating element and temperature probe which are located in the cup heater compartment
4) Loosen and remove the fastening screws of the cup holder (D)
5) Loosen the fastening screws of the boiler rear body (E)
6) Remove the rear body panels of the boiler (F)
7) After work is complete, put the body components back in place by following the procedure in reverse order



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Cod. 02000303 - Rev. 03 - 05/2005